Appendix G
Preliminary CHART Assessment for the Central Valley *O. mykiss* ESU

ESU Description

The CV *O. mykiss* ESU was listed as a threatened species in 1998 (63 FR 13347; March 19, 1998). The ESU includes all naturally spawned populations of *O. mykiss* in the Sacramento and San Joaquin Rivers and their tributaries, but excludes *O. mykiss* from San Francisco and San Pablo Bays and their tributaries. Based on an updated status review (NMFS 2003a) and an assessment of hatchery populations located within the range of the ESU (NMFS 2003b), NOAA Fisheries recently proposed that the ESU remain listed as a threatened species (69 FR 33102; June 14, 2004). In addition, NOAA Fisheries proposed that resident *O. mykiss* occurring with anadromous populations below impassable barriers (both natural and man made) and two artificially propagated populations (Coleman National Fish Hatchery on Battle Creek and Feather River Hatchery on the Feather River) also be included in the CV *O. mykiss* ESU. Two artificially propagated *O. mykiss* stocks reside within the historical geographic range of the ESU (Nimbus Fish Hatchery on the American River and Mokelumne River Hatchery on the Mokelumne River), but are not considered part of the ESU because they are derived from out-of-ESU broodstock (69 FR 33102; June 14, 2004). A Technical Recovery Team has been established for the Central Valley recovery planning domain and is in the process of identifying the historical and extant independent population structure of this ESU as well as the associated viability criteria for these populations.

CHART Area Assessments

The CHART assessment for the CV O. *mykiss* ESU addressed 67 occupied CALWATER Hydrologic Subareas (HSAs) organized or nested in 25 CALWATER Hydrologic Units (HUs) or subbasins (Figures G1 and G2). The HSAs were chosen as freshwater and estuarine critical habitat units because they provided a convenient and systematic way to organize the CHART's watershed assessments for this ESU. Also included in this assessment were four HSAs that encompass the San Francisco-San Pablo-Suisun Bay complex which represents a migratory corridor for this ESU (Figure G3). Information presented below for individual HUs (size, counties, total stream miles, occupied stream miles, and habitat use) were generated using GIS software from data compiled by NOAA Fisheries Southwest Region (NMFS 2004a).

Unit 1. Tehama Subbasin (HU#5504)

The Tehama HU is located in the northern central portion of the ESU an includes portions of the mainstem Sacramento River, the lower portions of two westside tributaries (Thomes and Stony Creeks), and the lower portions of three eastside tributaries (Mill Creek, Deer Creek, and Pine Creek). The HU encompasses an area approximately 1,119 mi^2 and occurs primarily in Tehama County, but also in portions of Butte and Glenn Counties. The HU contains 2 HSAs, both of which are occupied, and 1,879 stream miles (at 1:100,000 hydrography). Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify approximately 228 miles of occupied riverine in the 2 occupied HSAs (NMFS 2004a). The CHART concluded that these occupied HSAs contained one or more PCEs (i.e. spawning, rearing, and/or migratory habitat) and identified several management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine habitat for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G1 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation. The CHART team did not identify any unoccupied habitat areas in this subbasin that may be essential for the conservation of the ESU.

Unit 2. Whitmore Subbasin (HU#5507)

The Whitmore HU is located in the north eastern portion of the ESU and includes portions of upper Battle Creek (North and South Forks), upper Bear Creek, and the Cow Creek watershed. The HU encompasses an area approximately 913 mi^2 and occurs in Shasta and Tehama Counties. This HU contains 7 HSAs, all of which are occupied, and approximately 990 stream miles (at 1:100,000 hydrography). Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify approximately 177 miles of occupied riverine habitat in the 7 occupied HSAs (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine habitat identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G2 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation. The CHART team did not identify any unoccupied habitat

areas in this subbasin that may be essential for the conservation of the ESU.

Unit 3. Redding Subbasin (HU# 5508)

The Redding HU is located in the northern most portion of the ESU and includes portions of the upper Sacramento River mainstem, westside tributaries including Cottonwood Creek (portions of both the Middle and South Forks) and Clear Creek, and the lower portions of several eastside tributaries (Cow Creek, Bear Creek, and lower Battle Creek). The HU encompasses an area of approximately 705 mi^2 and occurs in Shasta and Tehama Counties. This HU contains 2 HSAs, both of which are occupied, and a total of 1,030 miles of streams (at 1:100,000 hydrography). Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify approximately 233 miles of occupied riverine habitat in the 2 occupied HSAs (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine habitat identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G3 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation.

Unit 4. Eastern Tehama Subbasin (HU# 5509)

The Eastern Tehama HU is located in the northeastern portion of the ESU and includes portions of several significant watersheds including Mill Creek, Deer Creek, Antelope Creek, and the upper portion of Big Chico Creek. The HU encompasses an area of approximately 896 mi^2 and occurs primarily in Tehama County with small portions in Butte, Shasta and Plumas Counties. This HU contains 10 HSAs, 6 of which are occupied, and a total of 1,049 miles of streams (at 1:100,000 hydrography). Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify approximately 151 miles of occupied riverine habitat in the 6 occupied HSAs (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine and estuarine habitat for the HSA that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G4 depicts the specific areas in this HU that are occupied

by the ESU and under consideration for the critical habitat designation.

The CHART team also concluded that inaccessible stream reaches in Upper Deer Creek above Upper Deer Creek Falls may be essential for the conservation of this ESU (NMFS 2004g). Historically, *O. mykiss* (steelhead) had access to this area when conditions allowed fish to pass the falls. A ladder was constructed in late 1940s but it provides poor attraction and passage conditions and has been closed since 2001. Deer Creek currently supports a population of steelhead and improved passage conditions into this reach would increase the amount of spawning, rearing and migration habitat available to the ESU.

Unit 5. Sacramento Delta (HU# 5510)

The Sacramento Delta HU is located in the south central portion of the ESU. The HU encompasses an area of approximately 446 mi^2 and occurs in portions of Yolo, Sacramento, and Solano Counties. This HU contains a single HSA which is occupied, and approximately 355 miles of streams (at 1:100,000 hydrography). Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify approximately 194 miles of occupied riverine habitat in this HSA (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine/estuarine habitat identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G5 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation. The CHART team did not identify any unoccupied habitat areas in this subbasin that may be essential for the conservation of the ESU.

Unit 6. Valley Putah-Cache Subbasin (HU# 5511)

The Valley Putah-Cache HU is located in the south central portion of the ESU and includes a portion of the Yolo Bypass and portions of west side tributaries Putah, Ulatis, and Alamo Creeks. This HU encompasses an area of approximately 961 mi^2 and occurs primarily in Yolo and Solano Counties. This HU contains 3 HSAs, 2 of which are is occupied, and 751 miles of streams (at 1:100,000 hydrography). Portions of these occupied HSAs are outside the boundary of ESU and the unoccupied HSA is completely outside the ESU boundary. Fish distribution and habitat use data compiled by NOAA

Fisheries biologists identify approximately 83 miles of occupied riverine habitat in the occupied HSAs (NMFS 2004a). The CHART concluded that the occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine habitat identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G6 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation.

Within this subbasin, the team also concluded that unoccupied stream reaches in Middle Putah Creek from Solano Irrigation Dam to Monticello Dam may be essential to the conservation of this ESU NMFS 2004g). Steelhead are thought to have historically utilized the upper watershed above Monticello Dam. There is currently a very small opportunistic population of steelhead in Lower Putah Creek, but habitat conditions in this area are not suitable for spawning or rearing. Providing fish passage past the Solano Irrigation Dam would provide access to suitable habitat for this ESU and efforts are currently underway to investigate the feasibility of providing passage beyond this Dam. The team concluded that this unoccupied area may be essential to conservation of the ESU because populations of steelhead in the Central Valley are constrained by the lack of accessible habitat and access to this area would provide cold water rearing and spawning habitat for this population.

Unit 7. American River Subbasin (HU# 5514)

The American River HU is located in the eastern portion of the ESU and includes portions of upper Coon Creek, Doty Creek, and Auburn Ravine. This HU encompasses an area of approximately 1,642 mi^2 and occurs primarily in El Dorado and Placer Counties. This HU contains 15 HSAs all of which are outside the range of the ESU; however, one of the HSAs is partially occupied (#551422) by the ESU. There are 104 miles of streams (at 1:100,000 hydrography) in the occupied HSA, but fish distribution and habitat use data compiled by NOAA Fisheries biologists identify only 20 miles of riverine habitat that is occupied HSA (NMFS 2004a). The CHART concluded that the occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine and/or estuarine reaches identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration

PCEs, as well as management activities that may affect the PCEs in each HSA. Map G7 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation. The CHART team did not identify any unoccupied habitat areas in this subbasin that may be essential for the conservation of the ESU.

Unit 8. Marysville Subbasin (HU# 5515)

The Marysville HU is located in the central portion of the ESU and includes portions of the Feather and Yuba Rivers. This HU encompasses an area of approximately 417 mi^2 and occurs primarily in Butte and Yuba Counties with smaller portions located in Sutter and Placer Counties. The HU contains 3 HSAs, all of which are occupied, and 562 miles of streams (at 1:100,000 hydrography). Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify approximately 75 miles of occupied riverine habitat in the 3 HSAs (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine and estuarine reaches identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G8 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation.

The CHART team did not identify any unoccupied habitat areas in this subbasin that may be essential for the conservation of the ESU. However, the team did conclude that inaccessible stream reaches in the adjacent subbasin (in HU#5518) which contains the Upper Feather River above Oroville Dam may be essential to the conservation of this ESU (NMFS 2004g). Specifically, the team identified the following stream reaches above Oroville Dam that may be essential for conservation of this ESU: from Oroville Dam upstream along the West Branch of the Feather River to the vicinity of Kimshew Falls; along the North Fork of the Feather River upstream of the location of Lake Almanor; along the East Branch of the NF Feather River including Indian Creek and Spanish Creek; the South Middle Fork of the Feather River, and the South Fork of the Feather River upstream to the first natural impassible barrier. Both steelhead and spring-run chinook salmon historically occurred in the Upper Feather River prior to Pacific Gas and Electric's hydroelectric development in the North Fork watershed and the construction of Oroville Dam. Construction of Oroville Dam extirpated both the

steelhead and spring-run chinook populations in this upper watershed. The team concluded that spawning, rearing, an migratory habitat is available above Oroville Dam in these inaccessible stream reaches, but it is in better condition for steelhead than spring-run chinook salmon. The feasibility of providing fish passage past Oroville Dam is currently being evaluated through the ongoing FERC relicensing process for this facility. The team concluded this inaccessible habitat may be essential for the conservation of this ESU because the natural production of steelhead in the lower Feather River is limited by the substantial lack of suitable spawning and rearing habitat below Oroville Dam, and access to the unoccupied habitat above the dam would allow for expansion of the population in this watershed.

Unit 9. Yuba River Subbasin (HU# 5517)

The Yuba River Santa Clara HU is located in the central and eastern portion of the ESU and includes part of the upper Yuba River watershed (Dry and Deer Creeks). This HU encompasses an area of approximately 1,436 mi^2 and occurs in several Counties including: Butte, Nevada, Placer, Plumas, Sierra, and Yuba. The HU contains 16 HSAs, 4 of which are occupied, and 2,048 miles of streams (at 1:100,000 hydrography); however, all but 2 HSAs are entirely outside the ESU boundary. Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify only approximately 22 miles of occupied riverine habitat in the 4 occupied HSAs (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine habitat for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G9 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation.

The CHART team concluded that inaccessible stream reaches of the Upper Yuba River above Englebright Dam may be essential to the conservation of this ESU, including those upstream reaches on the North Yuba to New Bullards Bar Dam, on the Middle Yuba to Milton Dam, and on the South Yuba to Lake Spaulding (NMFS 2004g). All three forks of the Upper Yuba River historically supported populations of spring chinook and steelhead (Yoshiyama et al., 1995). The team considered this area to be essential for conservation because it provides one of the largest areas of suitable habitat in the Central Valley that can be accessed by providing passage at one relatively small dam. The

Lower Yuba is also considered to have a good "seed" population of both spring chinook and steelhead and both populations are considered relatively free of hatchery influence. A large, multi-million dollar study program is underway through the CALFED Ecological Restoration Program to evaluate the feasibility of restoring anadromous salmonid populations to the Upper Yuba River.

Unit 10. Valley-American Subbasin (HU# 5519)

The Valley-American HU is located in the central-eastern portion of the ESU and includes portions of the American River and lower Auburn Ravine. This HU encompasses an area of approximately 958 mi^2 and occurs primarily in Placer, Sacramento, Sutter, and Yuba Counties. The HU contains 4 HSAs, only 2 of which are occupied, and approximately 1,188 miles of streams (at 1:100,000 hydrography). Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify approximately 190 miles of occupied riverine habitat in the 2 HSAs (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine and estuarine reaches identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G10 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation. The CHART team did not identify any unoccupied habitat areas in this subbasin that may be essential for the conservation of the ESU.

Unit 11. Colusa Basin Subbasin (HU# 5520)

The Colusa Basin HU is located in the central portion of the ESU and includes portions of the mainstem Sacramento River, lower Butte Creek, the Butte Creek-Sutter Bypass and Little Chico Creek. This HU encompasses an area of approximately 2,767 mi^2 and occurs in portions of Butte, Colusa, Glenn, Sutter, and Yolo Counties. The HU contains 5 HSAs, 3 of which are occupied, and 2,815 miles of streams (at 1:100,000 hydrography) although most of these stream miles are in unoccupied HSAs. Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify approximately 285 miles of occupied riverine habitat, including the Sutter Bypass, in the 3 HSAs (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied

riverine habitat identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G11 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation. The CHART team did not identify any unoccupied habitat areas in this subbasin that may be essential for the conservation of the ESU.

Unit 12. Butte Creek Subbasin (HU# 5521)

The Butte Creek HU is located in the northeastern portion of the ESU and contains portions of Butte Creek and Little Chico Creek. This HU encompasses an area of approximately 207 mi^2 and occurs primarily in Butte County. The HU contains 3 HSAs, all of which are occupied, and 310 miles of streams (at 1:100,000 hydrography). Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify approximately 38 miles of occupied riverine habitat in the single occupied HSA (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine reaches identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G12 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation.

The CHART team also concluded that inaccessible reaches of Upper Butte Creek above Centerville Dam upstream to Butte Meadow may be essential to the conservation of this ESU (NMFS 2004g). It is uncertain whether this area was historically used by the steelhead, but resident rainbow trout were historically present and still occur above Centerville Diversion Dam. Spawning, rearing, and migration is present and thought to be in good condition. The team believed this area may be essential for conservation because current spring-run chinook and steelhead spawning in this watershed is all below an elevation of 1,000 ft. High water temperatures in the lower portion of Butte Creek has led to significant spring-run chinook pre-spawning mortalities in recent years, and the team concluded that improved fish passage over the Centerville Diversion Dam would increase the range for both the-spring run chinook and steelhead ESUs, as well as reduce the risk of adult losses in the lower stream reaches. The team expects that feasibility of passage at the Centerville Diversion Dam will be evaluated through the upcoming FERC relicensing process for the facility.

Unit 13. Ball Mountain Subbasin (HU# 5523)

The Ball Mountain HU is located in the northwestern portion of the ESU and includes a portion of upper Thomes Creek and associated tributaries. This HU encompasses an area of approximately 334 mi^2 and occurs almost entirely in Tehama County. The HU contains 3 HSAs, only one of which is occupied, and 521 miles of streams (at 1:100,000 hydrography). Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify approximately 41 miles of occupied riverine habitat in the one occupied HSA (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine habitat for identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G13 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation. The CHART team did not identify any unoccupied habitat within this subbasin that may be essential for the conservation of this ESU.

Unit 14. Shasta Bally Subbasin (HU# 5524)

The Shasta Bally HU is located in the northwestern corner of the ESU and includes portions of South Fork Cottonwood Creek and Beegum Creek among others. This HU encompasses an area of approximately 905 mi^2 and occurs primarily in Shasta and Tehama Counties. The HU contains 9 HSAs, 5 of which are occupied, and approximately 1,003 miles of streams (at 1:100,000 hydrography). Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify approximately 122 miles of occupied riverine habitat in the 5 HSAs (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine habitat identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G14 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation. The CHART team did not identify any unoccupied habitat within this subbasin that may be essential for the conservation of this ESU.

Unit 15. North Valley Floor Subbasin (HU# 5531)

The North Valley Floor HU is located in the southeastern portion of the ESU and includes portions of the Calaveras River, Mokelumne River, and Cosumnes River. This HU encompasses an area of approximately 1,378 mi^2 and occurs primarily in San Joaquin, Sacramento, and Calaveras counties. The HU contains 5 HSAs, 3 of which are occupied, and approximately 2,195 miles of streams (at 1:100,000 hydrography). Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify only about 190 miles of occupied riverine habitat in the 3 HSAs (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine habitat identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G15 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation.

The CHART team also concluded that inaccessible stream reaches of the Upper Mokelumne River above Comanche Dam up to Bald Rock Falls (which is 7 miles above Electra Dam) may be essential to the conservation of this ESU, as well as spring-run chinook salmon (NMFS 2004g). Portions of this inaccessible habitat area extend into the Middle Sierra Subbasin (HU#5532). The Upper Mokelumne historically supported large runs of spring-run chinook salmon (Yoshiyama et al., 1995), and since steelhead and spring-run chinook use similar habitats it is assumed this area also supported large runs of steelhead. Suitable habitat exists above Comanche Dam, but it has been altered by Comanche and Pardee reservoirs. The team concluded that this area may be essential for conservation of the ESU because steelhead have been extirpated from the area above the dam and recovery of this ESU may require the re-establishment of multiple independent populations of steelhead throughout the Central Valley.

Unit 16. Middle Sierra Subbasin (HU# 5532)

The Middle Sierra HU is located in the eastern portion of the ESU and contains portions of the upper Cosumnes River watershed. This HU encompasses an area of approximately 1,424 mi^2 and occurs primarily in El Dorado, Amador, and Calaveras counties. The HU contains 6 HSAs, 4 of which are occupied. Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify only about 70 miles of occupied riverine habitat in the 4 HSAs (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU

and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine habitat identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G16 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation. As discussed for Unit 15 above, inaccessible portions of the upper Mokelumne River which may be essential to the conservation of this ESU extend into this subbasin. The CHART team did not identify any other unoccupied areas that may be essential to the conservation of the ESU.

Unit 17. Upper Calavera Subbasin (HU# 5533)

The Upper Calaveras HU is located in the eastern portion of the ESU and contains portions of the Calaveras River. This HU encompasses an area of approximately 362 mi^2 and occurs entirely in Calaveras county. The HU contains 3 HSAs, only one of which is occupied, and approximately 743 miles of streams (at 1:100,000 hydrography); however, there are only 17 miles of streams in the occupied HSA. Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify only about 6 miles of occupied riverine habitat in the HSA (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine reaches identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G17 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation. The CHART team did not identify any unoccupied areas in this subbasin that may be essential to the conservation of the ESU.

Unit 18. Stanislaus River Subbasin (HU# 5534)

The Stanislaus River HU is located in the southeastern portion of the ESU and contains portions of the Stanislaus River. This HU encompasses an area of approximately 998 mi^2 and occurs primarily in Tuolumne, Calaveras and Alpine counties. The HU contains 8 HSAs; however, only one is in the ESU and occupied. The HU has approximately 1,708 miles of streams (at 1:100,000 hydrography); however, there are only 18 miles of streams in the single occupied HSA. Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify only about 3 miles of occupied riverine habitat in this HSA

(NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine habitat identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G18 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation.

Within this subbasin, the CHART team also concluded that inaccessible stream reaches in the Middle Stanislaus River from Goodwin Dam to New Melones Dam may be essential to the conservation of this ESU (NMFS 2004g). The Stanislaus River historically supported a large population of spring-run chinook salmon and because steelhead utilize similar habitats it is likely that this River system also supported a large population of steelhead. Construction of Goodwin Dam blocked access of steelhead to those portions of the Stanislaus River above the Dam and largely extirpated this population. Recently, however, dam operations have provided conditions that allowed a few steelhead to spawn below Goodwin Dam. Suitable habitat is thought to exist above Goodwin Dam for steelhead and fish passage is considered feasible because of its low height. Based on preliminary technical recovery planning for ESUs in the central valley, recovery of this ESU will likely require the establishment of multiple independent steelhead populations particularly in the San Joaquin portion of the central valley.

Unit 19. San Joaquin Valley Floor Subbasin (HU# 5535)

The San Joaquin Valley Floor HU is located in the southeastern most portion of the ESU and contains portions of the Merced, Tuolumne, and Stanislaus Rivers (see Map G19). This HU encompasses an area of approximately 1,932 mi^2 and occurs primarily in Merced and Stanislaus counties. The HU contains 9 HSAs, several of which occur outside or partially outside the geographic boundary of the ESU. Of the 9 HSAs, 7 are occupied and contain approximately 1,313 miles of streams (at 1:100,000 hydrography). Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify only about 159 miles of occupied riverine habitat in these HSAs (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied habitat identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration

PCEs, as well as management activities that may affect the PCEs in each HSA. Map G19 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation.

Within this subbasin, the CHART team also concluded that inaccessible stream reaches in the Middle Tuolumne River (between LaGrange and New Don Pedro Dams) and the Middle Merced River (between Crocker-Huffman and Exchequer Dams) may be essential to the conservation of this ESU. Both rivers historically supported large populations of spring-run chinook salmon and because steelhead utilize similar habitat it is likely that these rivers also supported large populations of steelhead. Although current central valley steelhead populations are considered winter-run, habitat conditions in most San Joaquin basins, including the Tuolumne and Merced, may have historically supported summer steelhead (McEwan 1996; Yoshiyama 1996). With construction of LaGrange and Crocker-Huffman Dams, spring-chinook in both basins were extirpated, and most likely steelhead as well. Although steelhead cannot access the upper watersheds in the Tuolumne and Merced Rivers, dam operations in both watersheds have provided conditions allowing steelhead to spawn downstream of LaGrange and Crocker-Huffman Dams. The team believes that suitable habitat conditions exist above LaGrange and Crocker-Huffman Dams and that there may be opportunities to provide fish passage at each facility. Based on preliminary technical recovery planning for ESUs in the central valley, it is likely that recovery of this ESU will require the establishment of multiple independent steelhead populations particularly in the San Joaquin portion of the central valley.

Units 20 (Tuolumne River; HU#5536) and 21 (Merced River; HU#5537)

The Tuolumne River and Merced River HUs contains portions of the upper Tuolumne and Merced Rivers that are mostly or entirely outside the range of the ESU. The 2 HUs contain 18 HSAs and over 2,800 miles of streams (at 1:100,000 hydrography), but all are unoccupied by the ESU. The CHART team did not identify any areas in these subbasins that may be essential for the conservation of the ESU.

Unit 22. Delta-Mendota Canal Subbasin (HU#5541)

The Delta-Mendota Canal HU is located in the southernmost portion of the ESU and contains portions of the Delta-Mendota Canal. This HU encompasses an area of approximately 1,220 mi^2 and occurs primarily in Merced, Fresno, and Stanislaus counties. The HU contains 2 HSAs, both of which are occupied, and fish distribution and

habitat use data compiled by NOAA Fisheries biologists (at 1:100,000 hydrography) identify only about 50 miles of occupied riverine habitat in these HSAs (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine habitat identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G20 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation. The team did not identify any unoccupied areas in this subbasin that may be essential for the conservation of the ESU.

Unit 23. Middle West Side Subbasin (HU#5542)

The Middle West Side Subbasin is located in the southwestern portion of the ESU in the San Joaquin basin. The HU contain 4 HSAs and approximately 509 miles of streams (at 1:100,000 hydrography), but all are unoccupied by the ESU. The CHART team did not identify any areas in these subbasins that may be essential for the conservation of the ESU.

Unit 24. North Diablo Range (HU# 5543)

The North Diablo Range HU is located in the southwestern portion of the ESU and includes portions of the south and central Delta channel complex. This HU encompasses an area of approximately 315 mi^2 and occurs primarily in Alameda, Contra Costa, and San Joaquin counties. The HU contains only a single HSA, which is partially occupied, and 336 miles of streams (at 1:100,000 hydrography). Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify only approximately 4 miles of occupied riverine/estuarine habitat in this HSA (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine and/or habitat identified for each HSA watershed that contain spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G21 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation. The CHART team did not identify any unoccupied habitat areas in this subbasin that may be essential for the conservation of the ESU.

Unit 25. San Joaquin Delta Subbasin (HU# 5544)

The San Joaquin Delta HU is located in the southwestern portion of the ESU and includes portions of the south and central Delta channel complex. This HU encompasses an area of approximately 628 mi^2 and occurs primarily in Contra Costa and San Joaquin counties. The HU contains a single HSA which is occupied, and approximately 455 miles of streams and channels (at 1:100,000 hydrography). Fish distribution and habitat use data compiled by NOAA Fisheries biologists identify approximately 276 miles of occupied riverine and/or estuarine habitat in this HSA (NMFS 2004a). The CHART concluded that these occupied areas contained one or more PCEs (i.e. spawning, rearing, or migratory habitat) for this ESU and identified management activities that may affect the PCEs. Table G1 summarizes the total miles of occupied riverine and/or esttuarine habitat for each HSA watershed that contains spawning/rearing, rearing/migration, or migration PCEs, as well as management activities that may affect the PCEs in each HSA. Map G22 depicts the specific areas in this HU that are occupied by the ESU and under consideration for the critical habitat designation. The CHART team did not identify any unoccupied habitat areas in this subbasin that may be essential for the conservation of the ESU.

Unit 26. Suisun Bay (HU# 2207), San Pablo Bay (HU#2206) and San Francisco Bay (HU#s 2203 and 2204)

Portions of four HUs (2207, 2206, 2203, 2204) comprise the Suisun Bay- San Pablo-San Francisco Bay complex that is utilized by this ESU. These four HUs contain a large number of HSAs which include both Bay habitat as well as freshwater tributaries to the Bay complex, but only the four HSAs that comprise the Bay complex are occupied by this ESU (HSAs 220710, 220610, 220410, and 220312). These 4 HSA encompass approximately 427 mi^2 of estuarine habitat that serves as a rearing and migratory corridor that provides connectivity between upstream freshwater spawning, rearing, and migratory habitats for this ESU and the ocean. The CHART concluded that these four HSAs were occupied and contained PCEs for migratory habitat that support this ESU, and identified management activities that may affect the PCEs. Table G1 summarizes the management activities that may affect the PCEs in each HSA. Figure G3 depicts the specific areas (i.e. HSAs) in these HUs that are occupied by the ESU and under consideration for the critical habitat designation. The CHART team did not identify any unoccupied habitat areas in this subbasin that may be essential for the conservation of this ESU.

CHART Preliminary Conservation Value Rating

Freshwater and Estuarine Areas

After reviewing the best available scientific data regarding critical habitat for this ESU, the CHART concluded that most of the occupied HSAs were of high or medium conservation value to the ESU. Of the 67 occupied HSAs that were evaluated, 37 were rated as having high conservation value, 16 were rated as having medium conservation value, and 14 were rated as having low conservation value. Table G2 summaries the CHARTs PCE/watershed scores and preliminary conservation value ratings (i.e. low, medium or high) for all occupied HSAs. Figure G23 shows the overall spatial distribution of conservation scores by occupied HSA for the ESU.

Marine Areas

NOAA Fisheries determined that marine areas did not warrant consideration as critical habitat for this ESU.

References and Sources of Information

NMFS 2003a. Updated Status of Federally Listed ESUs of West Coast Salmon and Steelhead. West Coast Salmon Biological Review Team Report - NWFSC and SWFSC. July 2003

NMFS 2003b. Hatchery and Broodstock Summaries and Assessment for Chum, Coho and Chinook Salmon and Steelhead Stocks within ESUs listed under the ESA. Salmon and Steelhead Hatchery Assessment Group - NWFSC and SWFSC. May 2003

NMFS 2004a. GIS and Associated Data Related to Critical Habitat Designations for Seven ESUs of Salmon and *O. mykiss* in California. Compiled by NOAA Fisheries Southwest Region.

Table G1. Summary of Occupied Subbasins/Watersheds. PCE's, and Management Activities Affecting PCE's for the Central Valley Steelhead ESU

Map Code	Basin	HSA NAME	HSA NUMBER	Spawning/Rearing PCEs (mi)	Rearing/Migration PCEs (mi)	Presence/Migration Only PCEs (mi)	Management Activities*
	San Francisco Bay	Bay Waters	220312				AW, MW, PP, IS, DK, BS, ID
	San Francisco Bay	Bay Channel	220410				AW, MW, PP, IS, DK, BS, ID
	San Francisco Bay	San Pablo Bay	220610				AW, MW, PP, IS, DK, BS, ID
	Suisun Bay	Suisun Bay	220710				AW, MW, PP, IS, HR, DK, BS, WE, ID
	Tehama	Lower Stony Creek	550410	25	25	25	AW, FP, DO
	Tehama	Red Bluff	550420	203	203	203	AW, MW, PP, DK, BS, UD, RM
	Whitmore	Inks Creek	550711	2	2	2	RM
	Whitmore	Battle Creek	550712	82	82	82	AW, FP, WD
	Whitmore	Ash Creek	550721	9	9	9	RM
	Whitmore	Inwood	550722	33	33	33	AW, MW, UD
	Whitmore	South Cow Creek	550731	18	18	18	AW, FM, RM
	Whitmore	Old Cow Creek	550732	19	19	19	AW, RM, FM
	Whitmore	Little Cow Creek	550733	16	16	16	AW, RM, FM
	Redding	Enterprise Flat	550810	147	147	147	WS, DO, FP, PP, GM
	Redding	Lower Cottonwood	550820	75	75	75	AW, FP, RM
	Eastern Tehama	Big Chico Creek	550914	9	9	9	FP, FM, RM, RD
	Eastern Tehama	Mud Creek	550915				
	Eastern Tehama	Pine Creek	550916				
	Eastern Tehama	Deer Creek	550920	35	35	35	FM, RM
	Eastern Tehama	Big Dry Creek	550941				
	Eastern Tehama	Upper Mill Creek	550942	48	48	48	FM, RM
	Eastern Tehama	Dye Creek	550962	7	7	7	RM
	Eastern Tehama	Antelope Creek	550963	34	34	34	FM, AW, MW, RM
	Eastern Tehama	Paynes Creek	550964	17	17	17	RM, AW, FM
	Eastern Tehama	Salt Creek	550965				
	Sacramento Delta	Sacramento Delta	551000	199	199	199	AW, PP, IS, DK, BS
	Valley Putah-Cache	Elmira	551110	68	68	68	UD, AW, FP
	Valley Putah-Cache	Lower Putah Creek	551120	16	16	16	UD, AW, FP
	American River	Green Valley	551421				
	American River	Auburn	551422	20	20	20	UD, IW,
	American River	Folsom Reservior	551423				
	American River	Weber Creek	551431				
	American River	Coloma	551432				
	American River	Silver Creek	551433				
	American River	Union Valley	551434				
	American River	Kyburz	551435				
	American River	Silver Fork	551436				
	American River	Volcanoville	551441				
	American River	Duncan Canyon	551442				
	American River	Rubicon	551443				
	American River	Loon Lake	551444				
	American River	Hell Hole	551445				
	American River	Clementine	551451				
	Marysville	Lower Bear River	551510	17	17	17	AW
	Marysville	Lower Yuba River	551530	19	19	19	PP, AW, MW, DK, BS, FP
	Marysville	Lower Feather River	551540	40	40	40	HD, WS, PP, HM, DO
	Yuba River	Browns Valley	551712	17	17	17	AW, MW
	Yuba River	Mildred Lake	551713	0.4	0.4	0.4	AW
	Yuba River	Englebright	551714	1	1	1	AW, FP, DO
	Yuba River	Nevada City	551720	4	4	4	AW
	Yuba River	South Honcut Creek	551760				

	Valley-American	Franklin	551911		-		
	Valley-American	Lower American	551921	71	71	71	AW, MW, WS, UD, DO, PP, HM
	Valley-American	Pleasant Grove	551922	111	111	111	AW, FP, DK, BS, PP
	Colusa Basin	Sycamore-Sutter	552010	83	83	83	AW, HR, PP, DK, BS
	Colusa Basin	Colusa Trough	552021	-			AW, WH, AP, SF
	Colusa Basin	Orland	552022				
	Colusa Basin	Sutter Bypass	552030	70	70	70	AW, IS, SF, FP, WH
	Colusa Basin	Butte Basin	552040	131	131	131	AW, PP, FP, SF, DK, BS
	Butte Creek	Upper Dry Creek	552110	5	5	5	UD, RM, AW
	Butte Creek	Upper Butte Creek	552120	11	11	11	UD, RM, AW
	Butte Creek	Upper Little Chico	552130	22	22	22	WD
	Bull Mountain	Thomes Creek	552310	41	41	41	FM, AW, MW, RM
	Bull Mountain	Elder Creek	552321				
	Bull Mountain	Red Bank Creek	552322				
	Shasta Bally	South Fork	552433	43	43	43	FM, RM, RD
	Shasta Bally	Wells Creek	552434				
	Shasta Bally	Ono	552435	15	15	15	FM, RM, RD, WS
	Shasta Bally	Platina	552436	45	45	45	FM, RM, RD, WS
	Shasta Bally	Spring Creek	552440	12	12	12	WD, WS, PP, HM, DO
	Shasta Bally	Whiskeytown Lake	552461				
	Shasta Bally	Kanaka Peak	552462	7	7	7	HR, GM, WD, WS, DO
	Shasta Bally	Middle Clear	552463				
	Shasta Bally	French Gulch	552464				
	North Valley Floor	Herald	553111	78	78	78	AW, RM
	North Valley Floor	Lower Deer Creek	553112				
	North Valley Floor	Lower Mokelumne	553120	36	52	52	AW, DO, HM
	North Valley Floor	Lower Calaveras	553130	57	59	59	AW, MW, FP, CH, DK, BS
	North Valley Floor	Duck-Littlejohns	553140				
	Middle Sierra	Big Canyon Creek	553221	19	19	19	AW, FM
	Middle Sierra	Upper Deer Creek	553222				
	Middle Sierra	North Fork Cosumnes	553223	17	17	17	AW, FM
	Middle Sierra	Omo Ranch	553224	25	25	25	AW, FM
	Middle Sierra	Sutter Creek	553240	10	10	10	UD, HG, RM
	Middle Sierra	Upper Mokelumne	553260				
	Upper Calaveras	New Hogan Reservoir	553310	6	6	6	AW, MW, WS, GM
	Upper Calaveras	North Fork Calaveras	553320				
	Upper Calaveras	South Fork Calaveras	553330				
	Stanislaus River	Table Mountain	553410	3	3	3	FP, AW, WS, DO
	Stanislaus River	New Melones Reservoir	553421				
	Stanislaus River	Angels Camp	553422				
	Stanislaus River	South Fork Stanislaus	553430				
	Stanislaus River	Middle Fork Stanislaus	553441				
	Stanislaus River	Beardsley Lake	553442				
	Stanislaus River	North Fork Stanislaus	553450				
	Stanislaus River	Clark Fork	553460				
	San Joaquin Valley Floor	Manteca	553510	1	1	1	AW, FP, DK, BS
	San Joaquin Valley Floor	Valley Home	553520				
	San Joaquin Valley Floor	Riverbank	553530	54	54	54	AW, FP, DK, BS
	San Joaquin Valley Floor	Waterville	553540				
	San Joaquin Valley Floor	Turlock	553550	39	39	39	AW, DK, BS, FP
	San Joaquin Valley Floor	Montpelier	553560	14	14	14	AW, FP
	San Joaquin Valley Floor	El Nido-Stevinson	553570	2	11	11	AW, MW, UD
	San Joaquin Valley Floor	Merced	553580	33	33	33	AW, MW, UD
	San Joaquin Valley Floor	Fahr Creek	553590	7	7	7	AW
	Tuolumne River	Vizard Creek	553620				

	Tuolumne River	Sonora	553631		-		
	Tuolumne River	Don Pedro Reservoir	553632				
	Tuolumne River	Clavey River	553640				
	Tuolumne River	Mercut Peak	553651				
	Tuolumne River	Cherry Lake	553652	-			
	Tuolumne River	Lake Eleanor	553653				
	Tuolumne River	Hetch Hetchy	553660				
	Tuolumne River	Middle Tuolumne	553670				
	Tuolumne River	South Fork Tuolumne	553680				
	Merced River	Kassenbaum Flats	553710				
	Merced River	Coulterville	553721				
	Merced River	Lake McClure	553722				
	Merced River	North Fork Merced	553730				
	Merced River	South Fork Merced	553740				
	Merced River	Yosemite	553750				
	Merced River	Mount Starr King	553760				
	Delta-Mendota Canal	Patterson	554110		48	48	AW, MW, IS, PP, DG
	Delta-Mendota Canal	Los Banos	554120		1	1	AW, MW, UD
	Middle West Side	Del Puerto Creek	554210				
	Middle West Side	Orestimba Creek	554220				
	Middle West Side	Romero Creek	554231				
	Middle West Side	San Luis Reservoir	554232				
	North Diablo Range	North Diablo Range	554300	4	4	4	AW, MW, IS, PP
	San Joaquin Delta	San Joaquin Delta	554400	272	276	276	AW, MW, IS, PP, EF

*Management Activities Codes:

AP, Adult passage
AW - Agricultural water withdrawls
BS - Streamband stabilization for flood control
CH - channelization
DG - Dredging
DK - Diking
DO - Dam operations
EF - Entrainment and flow alterations
FM - Forest management
FP - Fish passage
GM - Gravel mining
HG - Historic gold mining
HM - Hatchery management
HR - Habitat restoration
ID - Industrial development
IS - Invasive/non-native species
MW - Municipal water withdrawls
PP - Point and non-point water pollution
RD - Roads
RM- Rangeland management
SF - Seasonal flooding for flood control
UD - Urban development
WD - Water diversion for hydroelectric
WE - Wetland/Estuary management
WH - Wildlife habitat management
WS - Water storage for flood control

Table F2. Summary of Preliminary Scores and Overall Rankings of Conservation Values for Critical Habitat for HSA watersheds occupied by the Central Valley Steelhead ESU

Map Code	Basin	Watershed	Calwater Unit	Total Score (0-18)	Comments / Other Considerations	Preliminary Conservation Value
	San Francisco Bay	Bay Waters	220312	10		High
	San Francisco Bay	Bay Channel	220410	5		Low
	San Francisco Bay	San Pablo Bay	220610	10		High
	Suisun Bay	Suisun Bay	220710	10		High
	Tehama	Lower Stony Creek	550410	8		Medium
	Tehama	Red Bluff	550420	15		High
	Whitmore	Inks Creek	550711	5		Low
	Whitmore	Battle Creek	550712	17		High
	Whitmore	Ash Creek	550721	5		Low
	Whitmore	Inwood	550722	9		Medium
	Whitmore	South Cow Creek	550731	9		Medium
	Whitmore	Old Cow Creek	550732	11		High
	Whitmore	Little Cow Creek	550733	11		High
	Redding	Enterprise Flat	550810	14		High
	Redding	Lower Cottonwood	550820	10		High
	Eastern Tehama	Big Chico Creek	550914	12		High
	Eastern Tehama	Mud Creek	550915	0		Not Occupied
	Eastern Tehama	Pine Creek	550916	0		Not Occupied
	Eastern Tehama	Deer Creek	550920	15		High
	Eastern Tehama	Big Dry Creek	550941	0		Not Occupied
	Eastern Tehama	Upper Mill Creek	550942	15		High
	Eastern Tehama	Dye Creek	550962	5		Low
	Eastern Tehama	Antelope Creek	550963	14		High
	Eastern Tehama	Paynes Creek	550964	9		Medium
	Eastern Tehama	Salt Creek	550965	0		Not Occupied
	Sacramento Delta	Sacramento Delta	551000	13		High
	Valley Putah-Cache	Elmira	551110	9		Medium
	Valley Putah-Cache	Lower Putah Creek	551120	10	Medium ranking because of no connectivity	Medium
	American River	Green Valley	551421	0		Not Occupied
	American River	Auburn	551422	9		Medium
	American River	Folsom Reservior	551423	0		Not Occupied
	American River	Weber Creek	551431	0		Not Occupied
	American River	Coloma	551432	0		Not Occupied
	American River	Silver Creek	551433	0		Not Occupied
	American River	Union Valley	551434	0		Not Occupied
	American River	Kyburz	551435	0		Not Occupied
	American River	Silver Fork	551436	0		Not Occupied
	American River	Volcanoville	551441	0		Not Occupied
	American River	Duncan Canyon	551442	0		Not Occupied
	American River	Rubicon	551443	0		Not Occupied
	American River	Loon Lake	551444	0		Not Occupied
	American River	Hell Hole	551445	0		Not Occupied
	American River	Clementine	551451	0		Not Occupied
	Marysville	Lower Bear River	551510	7		Low
	Marysville	Lower Yuba River	551530	16		High
	Marysville	Lower Feather River	551540	13		High
	Yuba River	Browns Valley	551712	15		High
	Yuba River	Mildred Lake	551713	6		Low

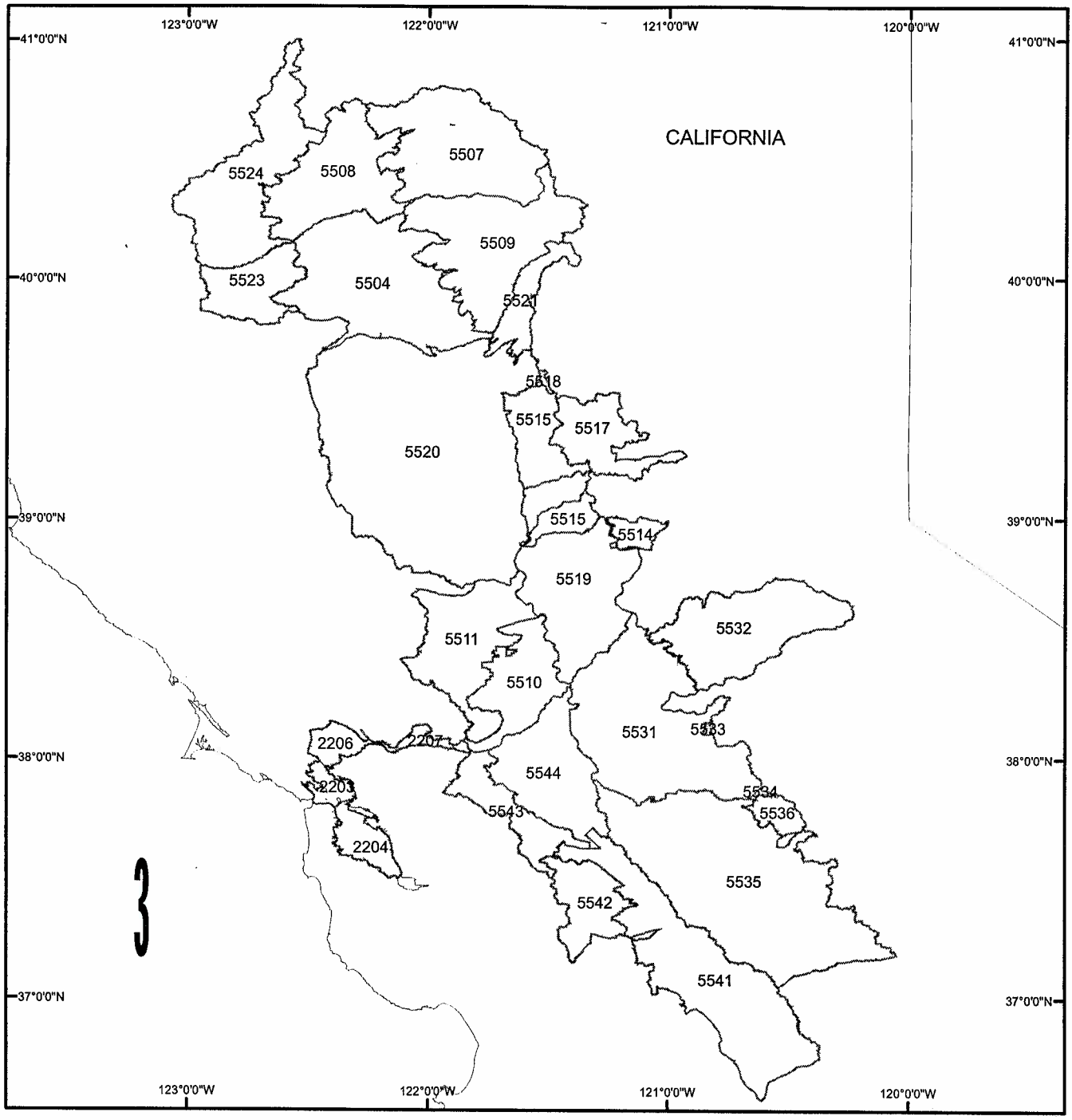
	Yuba River	Englebright	551714	10	-	High
	Yuba River	Nevada City	551720	6		Low
	Yuba River	South Honcut Creek	551760	0		Not Occupied
	Valley-American	Franklin	551911	0		Not Occupied
	Valley-American	Lower American	551921	13		High
	Valley-American	Pleasant Grove	551922	10		High
	Colusa Basin	Sycamore-Sutter	552010	12		High
	Colusa Basin	Colusa Trough	552021	5		High
	Colusa Basin	Orland	552022	0		Not Occupied
	Colusa Basin	Sutter Bypass	552030	10		High
	Colusa Basin	Butte Basin	552040	11		High
	Butte Creek	Upper Dry Creek	552110	5		Low
	Butte Creek	Upper Butte Creek	552120	5		Low
	Butte Creek	Upper Little Chico	552130	11		High
	Bull Mountain	Thomes Creek	552310	14		High
	Bull Mountain	Elder Creek	552321	0		Not Occupied
	Bull Mountain	Red Bank Creek	552322	0		Not Occupied
	Shasta Bally	South Fork	552433	8		Medium
	Shasta Bally	Wells Creek	552434	0		Not Occupied
	Shasta Bally	Ono	552435	9		Medium
	Shasta Bally	Platina	552436	9		Medium
	Shasta Bally	Spring Creek	552440	12		High
	Shasta Bally	Whiskeytown Lake	552461	0		Not Occupied
	Shasta Bally	Kanaka Peak	552462	14		High
	Shasta Bally	Middle Clear	552463	0		Not Occupied
	Shasta Bally	French Gulch	552464	0		Not Occupied
	North Valley Floor	Herald	553111	7		Low
	North Valley Floor	Lower Deer Creek	553112	0		Not Occupied
	North Valley Floor	Lower Mokelumne	553120	9		Medium
	North Valley Floor	Lower Calaveras	553130	12		High
	North Valley Floor	Duck-Littlejohns	553140	0		Not Occupied
	Middle Sierra	Big Canyon Creek	553221	7		Low
	Middle Sierra	Upper Deer Creek	553222	0		Not Occupied
	Middle Sierra	North Fork Cosumnes	553223	7		Low
	Middle Sierra	Omo Ranch	553224	7		Low
	Middle Sierra	Sutter Creek	553240	6		Low
	Middle Sierra	Upper Mokelumne	553260	0		Not Occupied
	Upper Calaveras	New Hogan Reservoir	553310	12		High
	Upper Calaveras	North Fork Calaveras	553320	0		Not Occupied
	Upper Calaveras	South Fork Calaveras	553330	0		Not Occupied
	Stanislaus River	Table Mountain	553410	13		High
	Stanislaus River	New Melones Reservoir	553421	0		Not Occupied
	Stanislaus River	Angels Camp	553422	0		Not Occupied
	Stanislaus River	South Fork Stanislaus	553430	0		Not Occupied
	Stanislaus River	Middle Fork Stanislaus	553441	0		Not Occupied
	Stanislaus River	Beardsley Lake	553442	0		Not Occupied
	Stanislaus River	North Fork Stanislaus	553450	0		Not Occupied
	Stanislaus River	Clark Fork	553460	0		Not Occupied
	San Joaquin Valley Floor	Manteca	553510	12		High
	San Joaquin Valley Floor	Valley Home	553520	0		Not Occupied
	San Joaquin Valley Floor	Riverbank	553530	12		High

	San Joaquin Valley Floor	Warnersville	553540	0	-	Not Occupied
	San Joaquin Valley Floor	Turlock	553550	11		High
	San Joaquin Valley Floor	Montpelier	553560	13		High
	San Joaquin Valley Floor	El Nido-Stevinson	553570	7		Medium
	San Joaquin Valley Floor	Merced	553580	7		Medium
	San Joaquin Valley Floor	Fahr Creek	553590	9		Medium
	Tuolumne River	Vizard Creek	553620	0		Not Occupied
	Tuolumne River	Sonora	553631	0		Not Occupied
	Tuolumne River	Don Pedro Reservoir	553632	0		Not Occupied
	Tuolumne River	Clavey River	553640	0		Not Occupied
	Tuolumne River	Mercut Peak	553651	0		Not Occupied
	Tuolumne River	Cherry Lake	553652	0		Not Occupied
	Tuolumne River	Lake Eleanor	553653	0		Not Occupied
	Tuolumne River	Hetch Hetchy	553660	0		Not Occupied
	Tuolumne River	Middle Tuolumne	553670	0		Not Occupied
	Tuolumne River	South Fork Tuolumne	553680	0		Not Occupied
	Merced River	Kassenbaum Flats	553710	0		Not Occupied
	Merced River	Coulterville	553721	0		Not Occupied
	Merced River	Lake McClure	553722	0		Not Occupied
	Merced River	North Fork Merced	553730	0		Not Occupied
	Merced River	South Fork Merced	553740	0		Not Occupied
	Merced River	Yosemite	553750	0		Not Occupied
	Merced River	Mount Starr King	553760	0		Not Occupied
	Delta-Mendota Canal	Patterson	554110	10		High
	Delta-Mendota Canal	Los Banos	554120	5	Medium ranking because of connectivity	Medium
	Middle West Side	Del Puerto Creek	554210	0		Not Occupied
	Middle West Side	Orestimba Creek	554220	0		Not Occupied
	Middle West Side	Romero Creek	554231	0		Not Occupied
	Middle West Side	San Luis Reservoir	554232	0		Not Occupied
	North Diablo Range	North Diablo Range	554300	8		Medium
	San Joaquin Delta	San Joaquin Delta	554400	10		High

Figures G1, G2 and G3:

G1 - CALWATER Hydrologic Units (HU) for the Central Valley *O. mykiss* ESU
G2 - CALWATER Hydrologic Subareas (HSAs) for the Central Valley *O. mykiss* ESU
G3 - CALWATER HSAs comprising the San Francisco-San Pablo-Suisun Bay Complex occupied by the Central Valley *O. mykiss* ESU

Map of the California Central Valley O. mykiss ESU

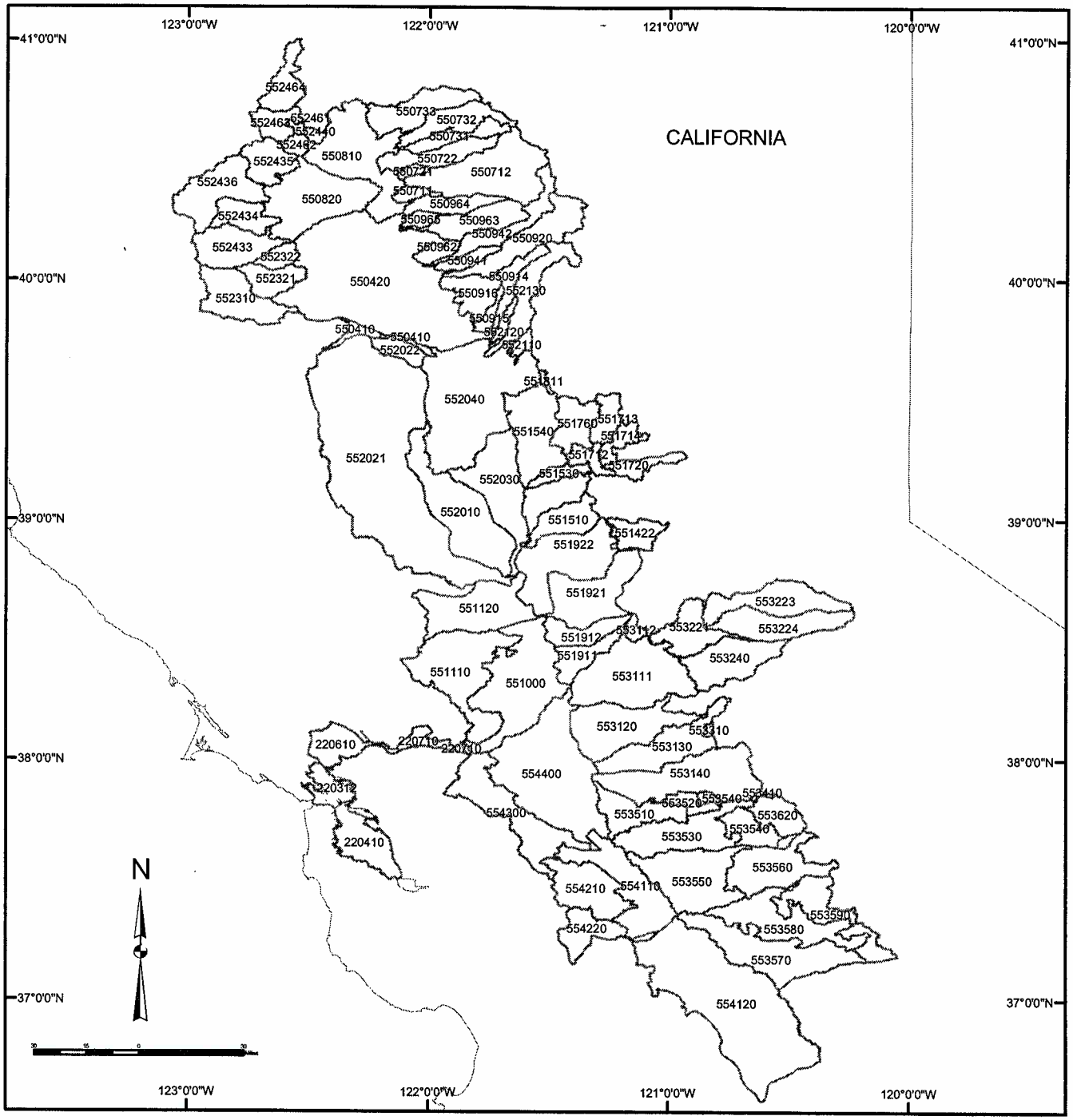


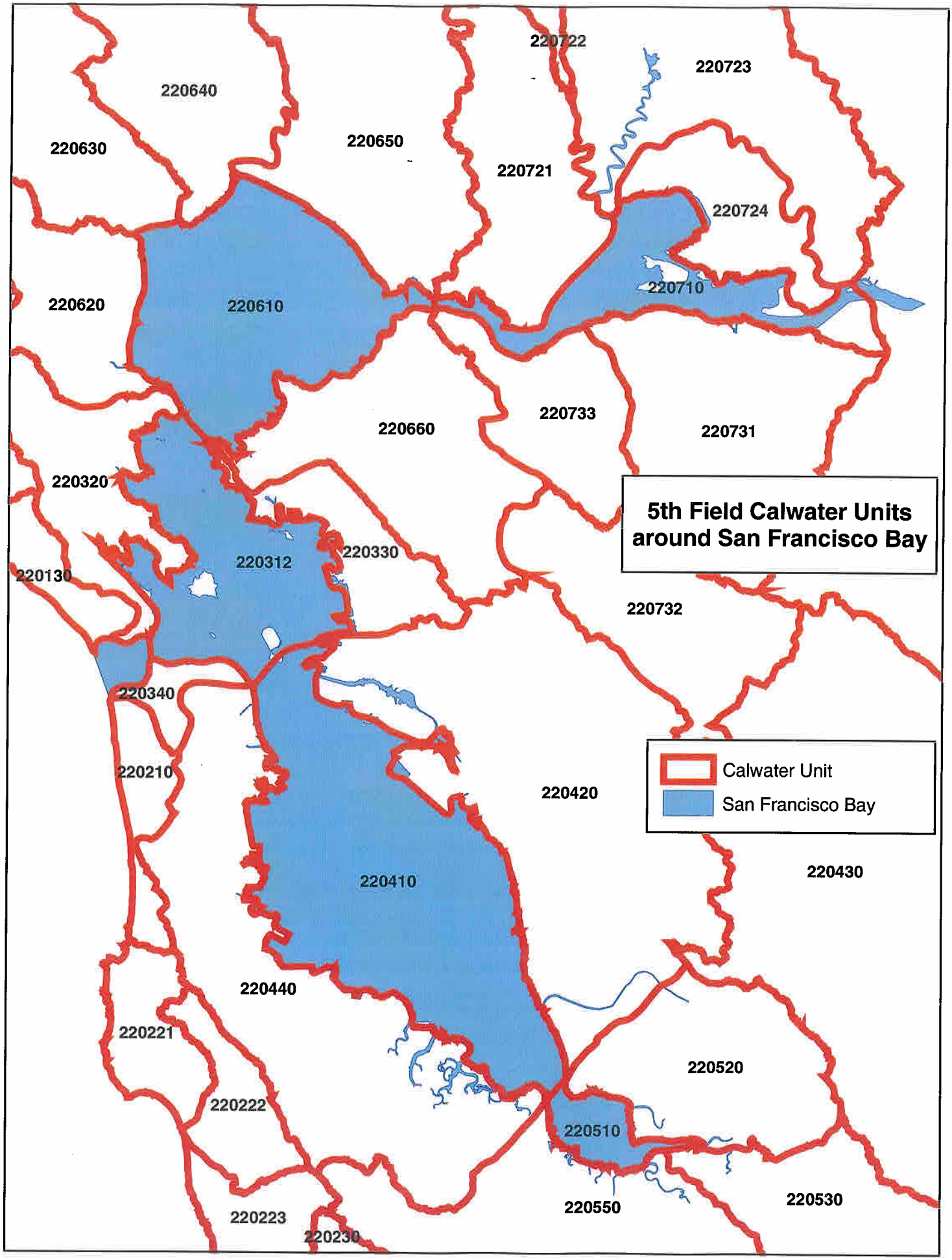
Hydrologic Unit Boundary

State Boundaries

Area of Detail

Map of the Central Valley O. Mykiss ESU

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220723
220640
220630
220650
220721
220724
220710
220620
220610
220733
220660
220731
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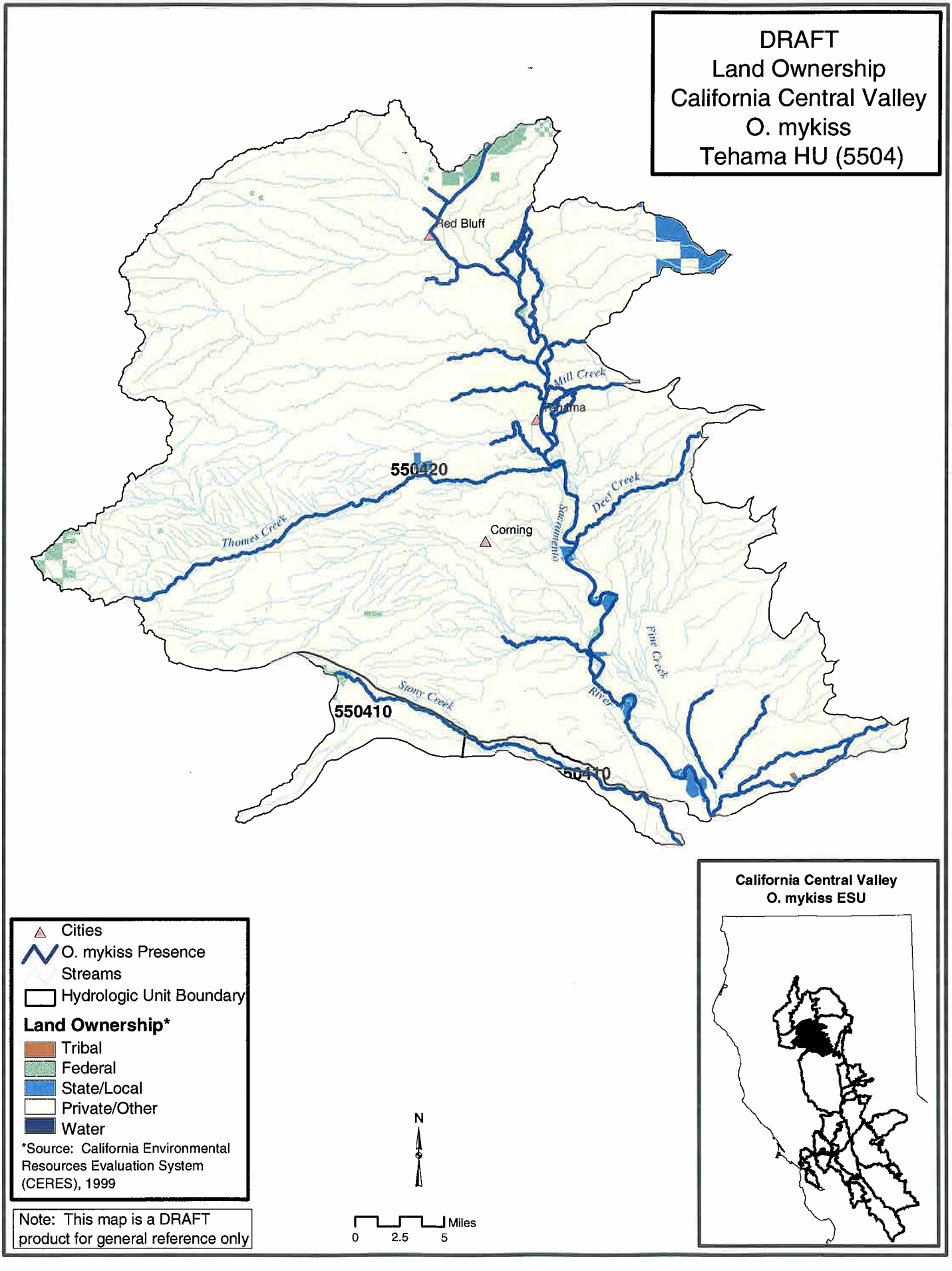
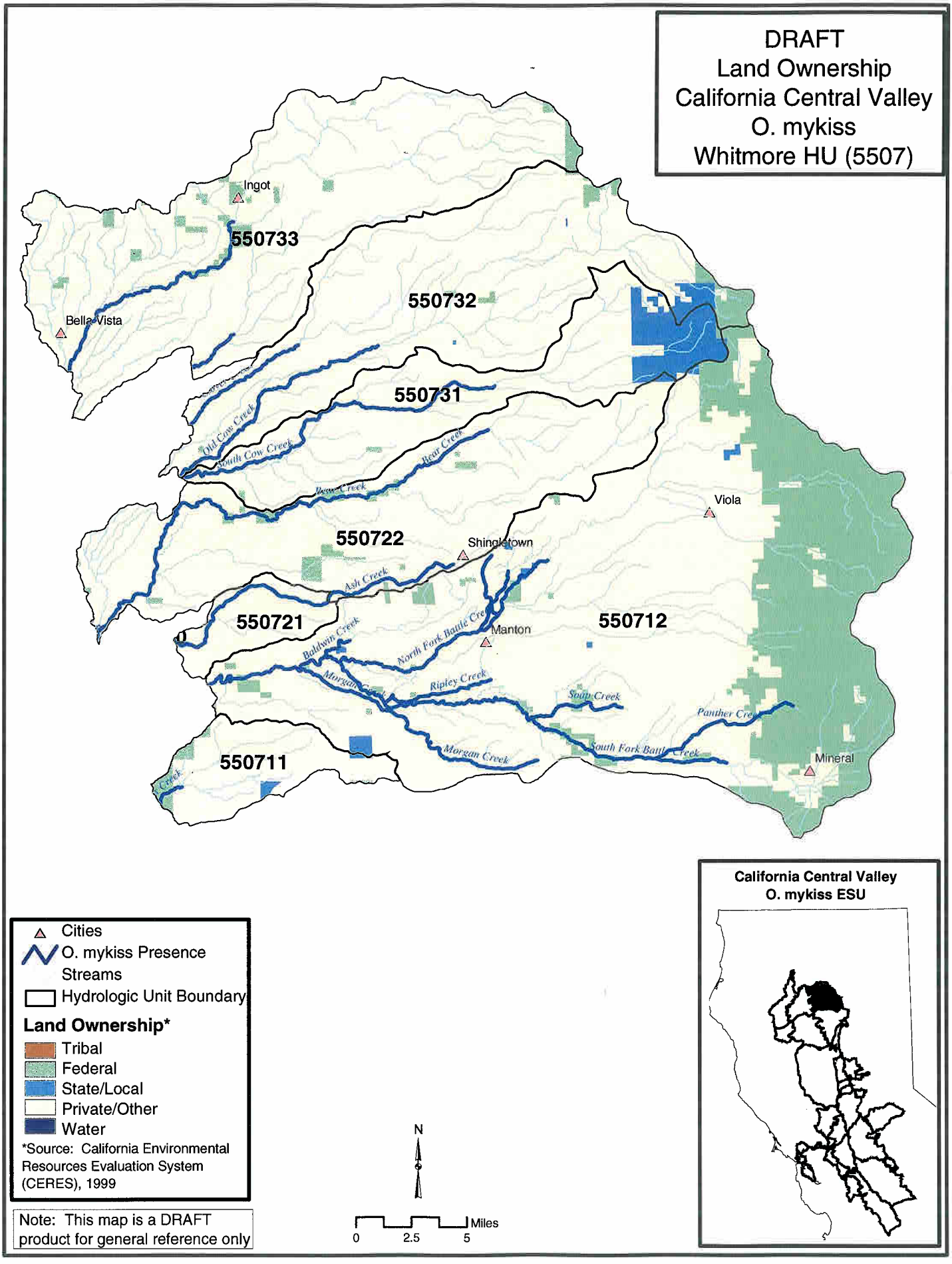
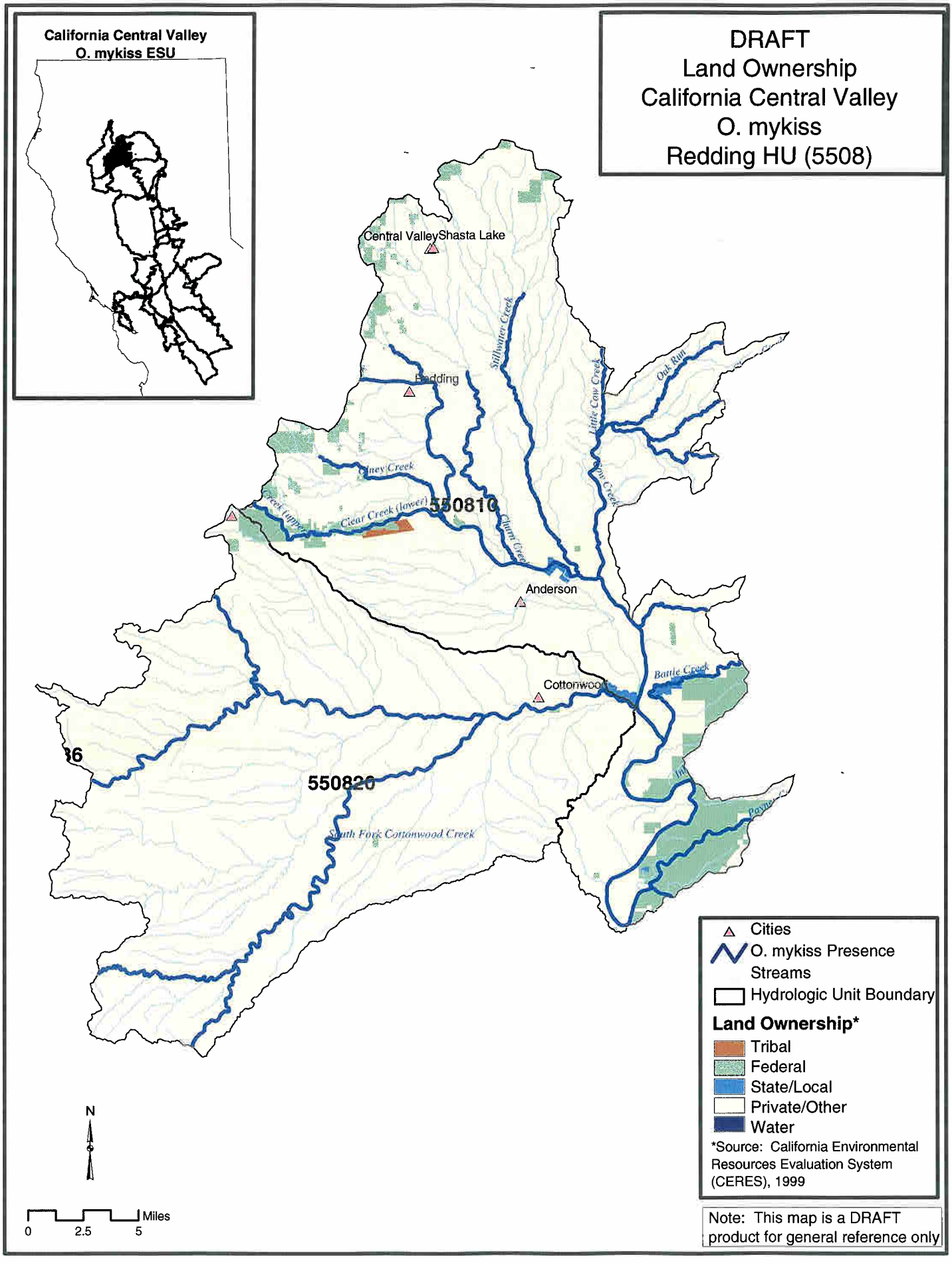
220312
220330
220130
220732
220340
220210
220420
220410
220430
220440
220221
220520
220222
220510
220223
220550
220530
220230
5th Field Calwater Units around San Francisco Bay
Calwater Unit
San Francisco Bay

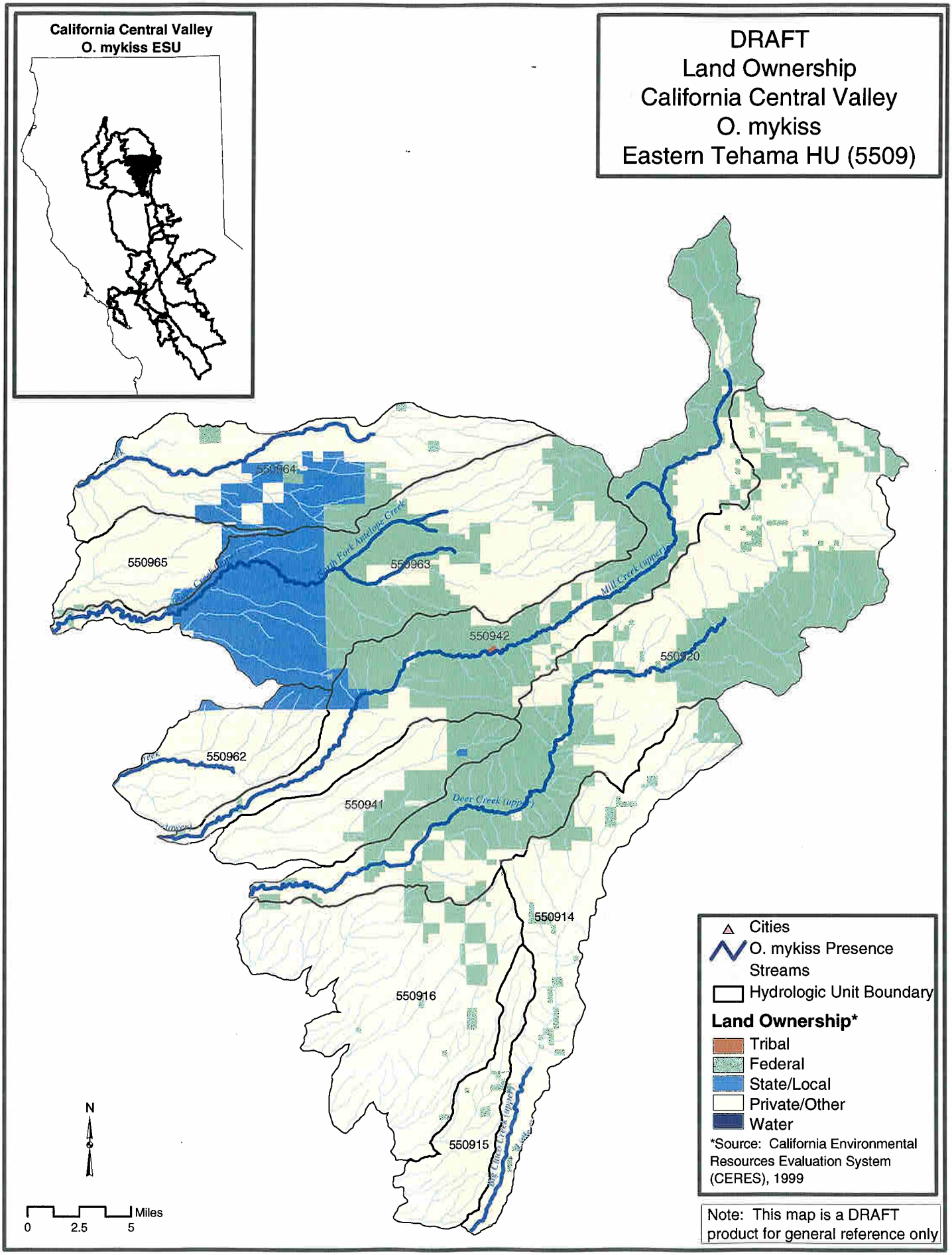
Maps G1 through G26 : Central Valley *O. mykiss* ESU - Areas (Units) Under Consideration for Critical Habitat Designation

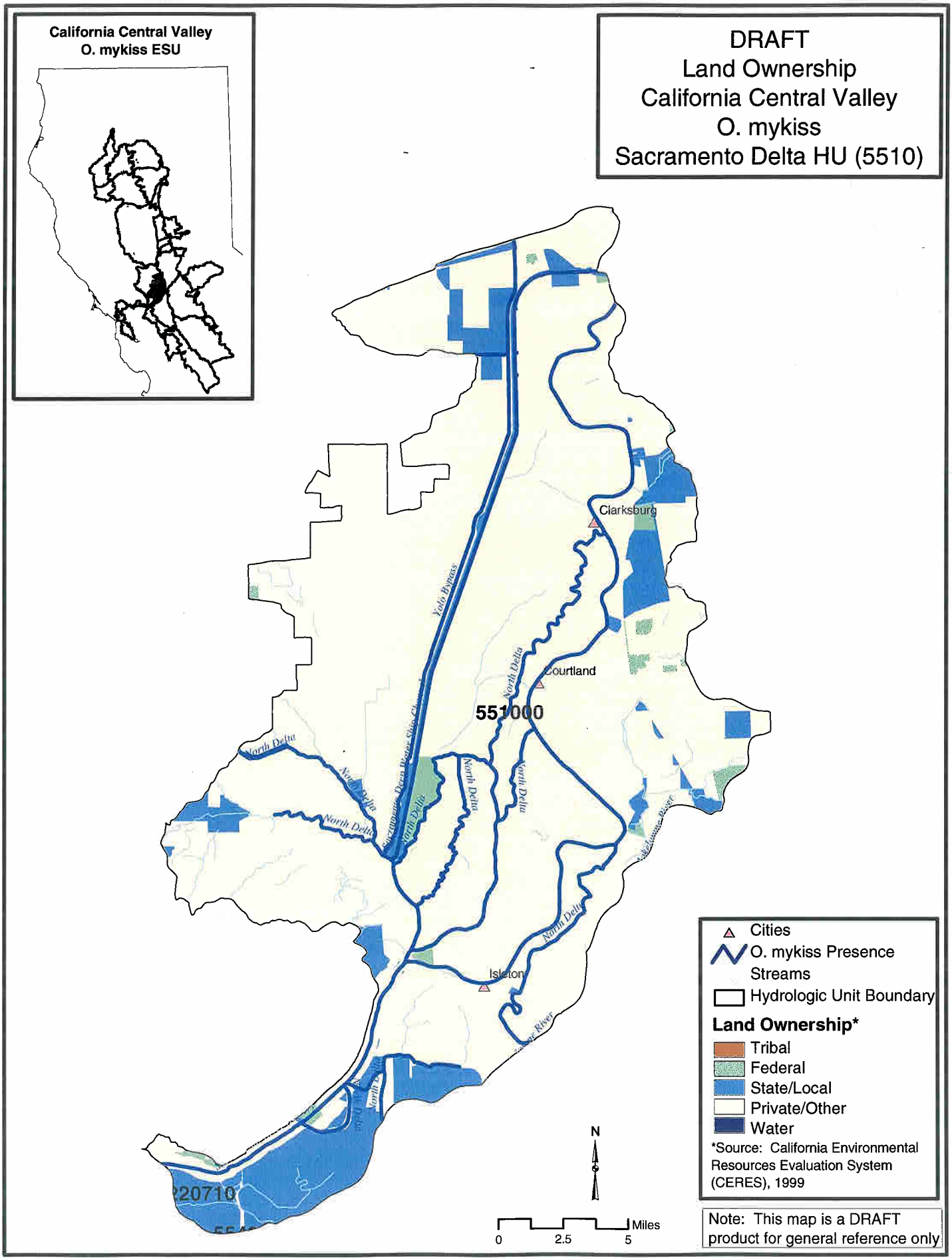
G1 - Unit 5504 (Tehama HU)
G2 - Unit 5507 (Whitmore HU)
G3 - Unit 5508 (Redding HU)
G4 - Unit 5509 (Eastern Tehama HU)
G5 - Unit 5510 (Sacramento Delta HU)
G6 - Unit 5511 (Valley Putah-Cache HU)
G7 - Unit 5514 (American River HU)
G8 - Unit 5515 (Marysville HU)
G9 - Unit 5517 (Yuba River HU)
G10 - Unit 5519 (Valley-American HU)
G11 - Unit 5520 (Colusa Basin HU)
G12 - Unit 5521 (Butte Creek HU)
G13 - Unit 5523 (Ball Mountain HU)
G14 - Unit 5524 (Shasta Bally HU)
G15 - Unit 5531 (North Valley Floor HU)
G16 - Unit 5532 (Middle Sierra HU)
G17 - Unit 5533 (Upper Calaveras HU)
G18 - Unit 5534 (Stanislaus River HU)
G19 - Unit 5535 (San Joaquin Valley Floor HU)
G20 - Unit 5541 (Delta-Mendota Canal HU)
G21 - Unit 5543 (North Diablo Range HU)
G22 - Unit 5544 (San Joaquin HU)


DRAFT
Land Ownership
California Central Valley
O. mykiss
Tehama HU (5504)
Red Bluff
Mill Creek
Tehama
550420
Deer Creek
Thomes Creek
Sacramento
Corning
Stony Creek
Pine Creek
River
550410
550410
Cities
O. mykiss Presence
Streams
Hydrologic Unit Boundary
Land Ownership*
Tribal
Federal
State/Local
Private/Other
Water
*Source: California Environmental Resources Evaluation System (CERES), 1999
Note: This map is a DRAFT product for general reference only
N
0
2.5
5
Miles
California Central Valley
O. mykiss ESU

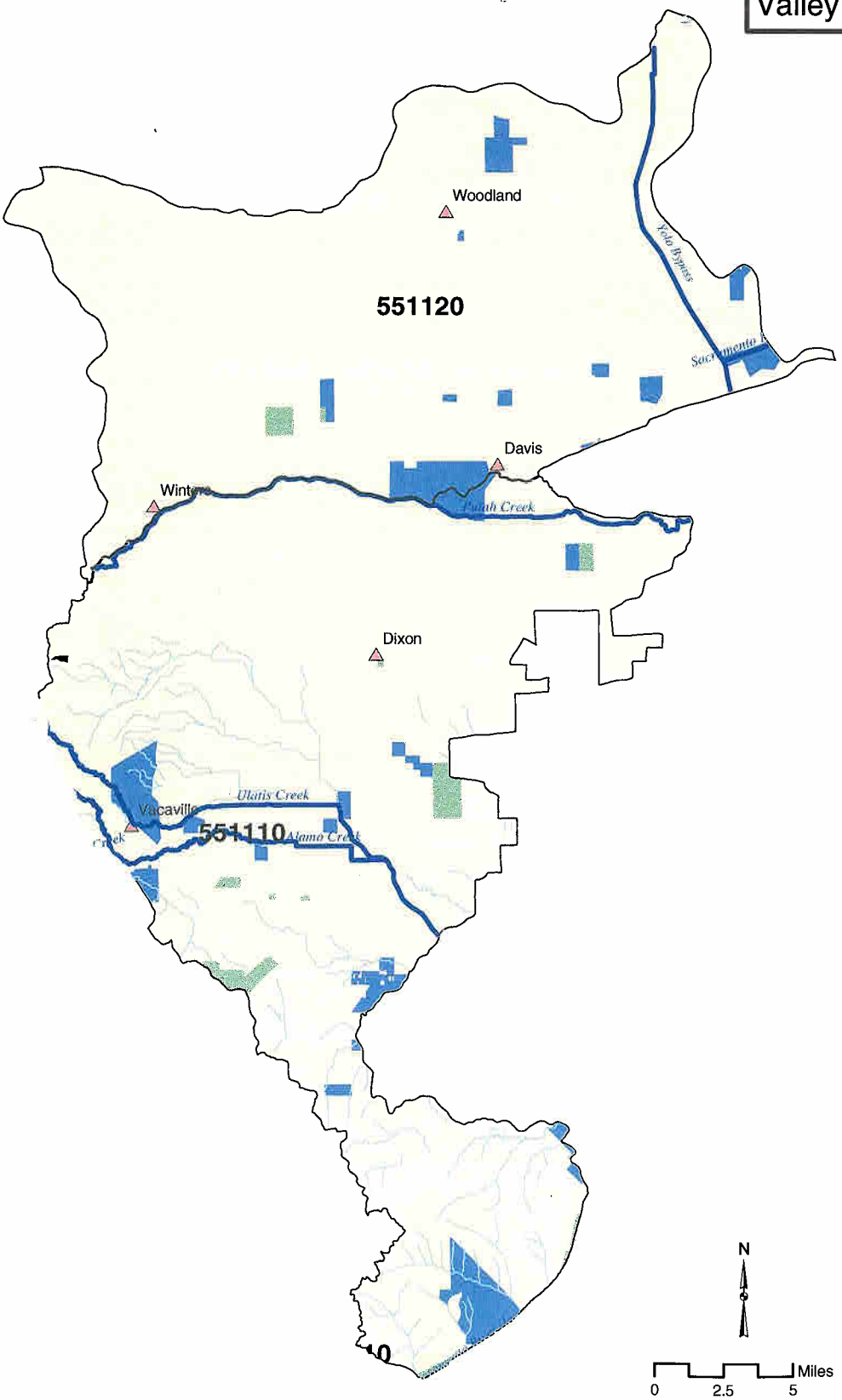

DRAFT
Land Ownership
California Central Valley
O. mykiss
Whitmore HU (5507)
Ingot
550733
Bella Vista
550732
550731
Old Cow Creek
South Cow Creek
Bear Creek
Viola
550722
Shingletown
Ash Creek
550721
Baldwin Creek
North Fork Battle Creek
Manton
550712
Ripley Creek
South Creek
Panther Creek
Morgan Creek
South Fork Battle Creek
Mineral
550711
Cities
O. mykiss Presence
Streams
Hydrologic Unit Boundary
Land Ownership*
Tribal
Federal
State/Local
Private/Other
Water
*Source: California Environmental Resources Evaluation System (CERES), 1999
Note: This map is a DRAFT product for general reference only
N
0
2.5
5
Miles
California Central Valley
O. mykiss ESU

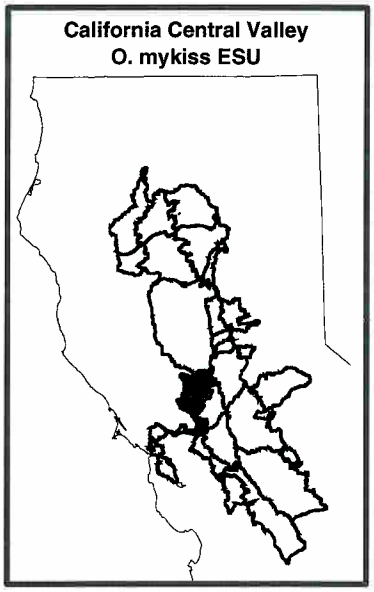

California Central Valley
O. mykiss ESU
DRAFT
Land Ownership
California Central Valley
O. mykiss
Redding HU (5508)
Central Valley
Shasta Lake
Redding
Stillwater Creek
Little Cow Creek
Oak Run
Clear Creek (lower)
550810
Churn Creek
Anderson
Cottonwood
Battle Creek
550820
South Fork Cottonwood Creek
Cities
O. mykiss Presence
Streams
Hydrologic Unit Boundary
Land Ownership*
Tribal
Federal
State/Local
Private/Other
Water
*Source: California Environmental Resources Evaluation System (CERES), 1999
N
Miles
0
2.5
5
Note: This map is a DRAFT product for general reference only


California Central Valley
O. mykiss ESU
DRAFT
Land Ownership
California Central Valley
O. mykiss
Eastern Tehama HU (5509)
550964
550965
550963
550942
550920
550962
550941
550914
550916
550915
South Fork Antelope Creek
Mill Creek (upper)
Deer Creek (upper)
Big Chico Creek (upper)
N
0
2.5
5
Miles
Cities
O. mykiss Presence
Streams
Hydrologic Unit Boundary
Land Ownership*
Tribal
Federal
State/Local
Private/Other
Water
*Source: California Environmental Resources Evaluation System (CERES), 1999
Note: This map is a DRAFT product for general reference only


California Central Valley
O. mykiss ESU
DRAFT
Land Ownership
California Central Valley
O. mykiss
Sacramento Delta HU (5510)
Clarksburg
Courtland
Isleton
Yolo Bypass
North Delta
551000
Cities
O. mykiss Presence
Streams
Hydrologic Unit Boundary
Land Ownership*
Tribal
Federal
State/Local
Private/Other
Water
*Source: California Environmental Resources Evaluation System (CERES), 1999
N
0
2.5
5
Miles
Note: This map is a DRAFT product for general reference only

DRAFT
Land Ownership
California Central Valley
O. mykiss
Valley Putah-Cache HU (5511)





Cities
O. mykiss Presence
Streams
Hydrologic Unit Boundary

Land Ownership*

Tribal
Federal
State/Local
Private/Other
Water

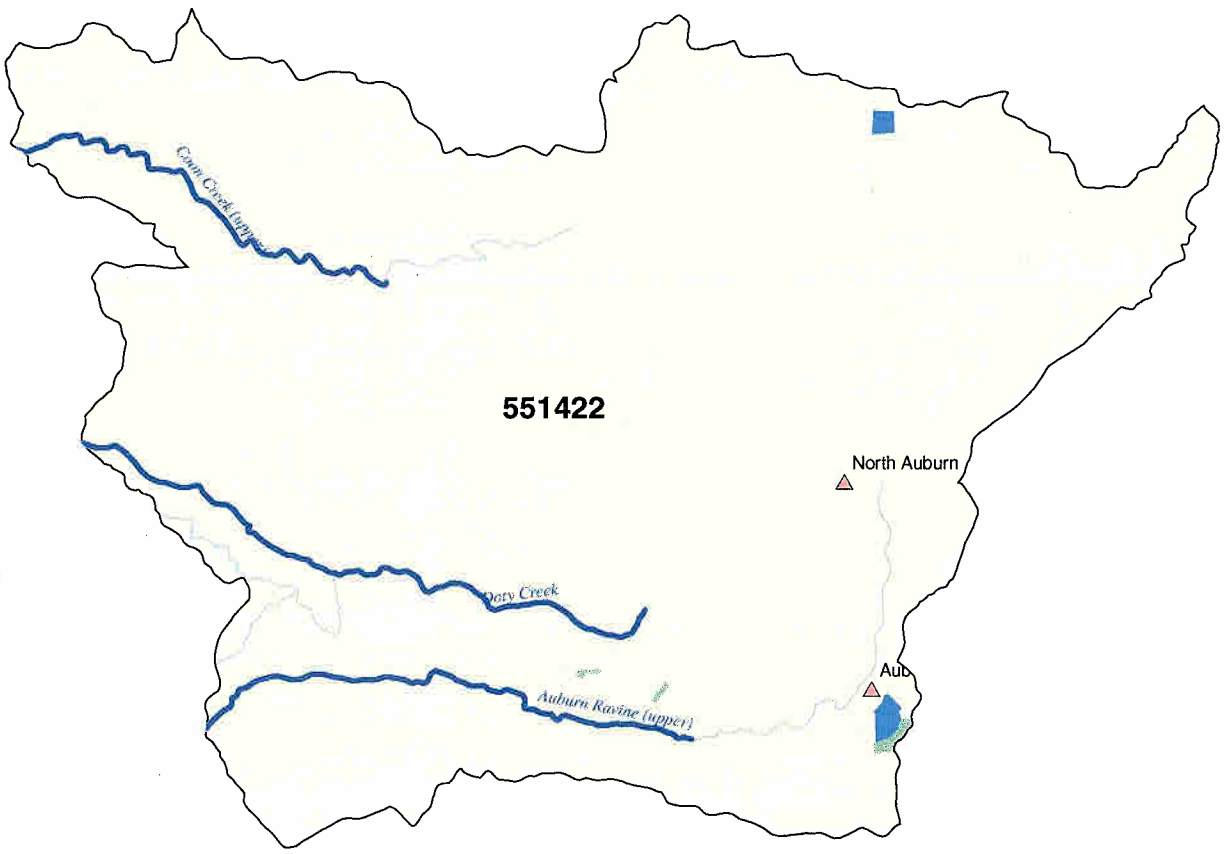
*Source: California Environmental Resources Evaluation System (CERES), 1999

N

0 2.5 5 Miles

Note: This map is a DRAFT product for general reference only

DRAFT
Land Ownership
California Central Valley
O. mykiss
American River HU (5514)



- Cities
- O. mykiss Presence Streams
- Hydrologic Unit Boundary

Land Ownership*

- Tribal
- Federal
- State/Local
- Private/Other
- Water

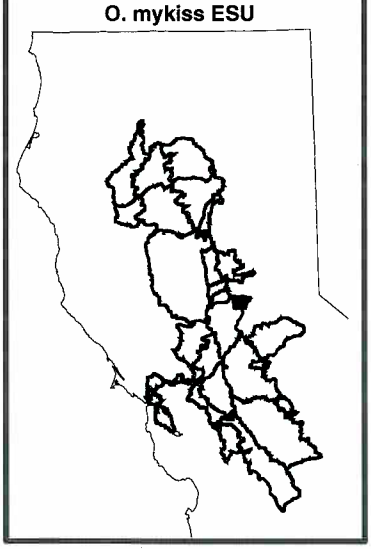
*Source: California Environmental Resources Evaluation System (CERES), 1999

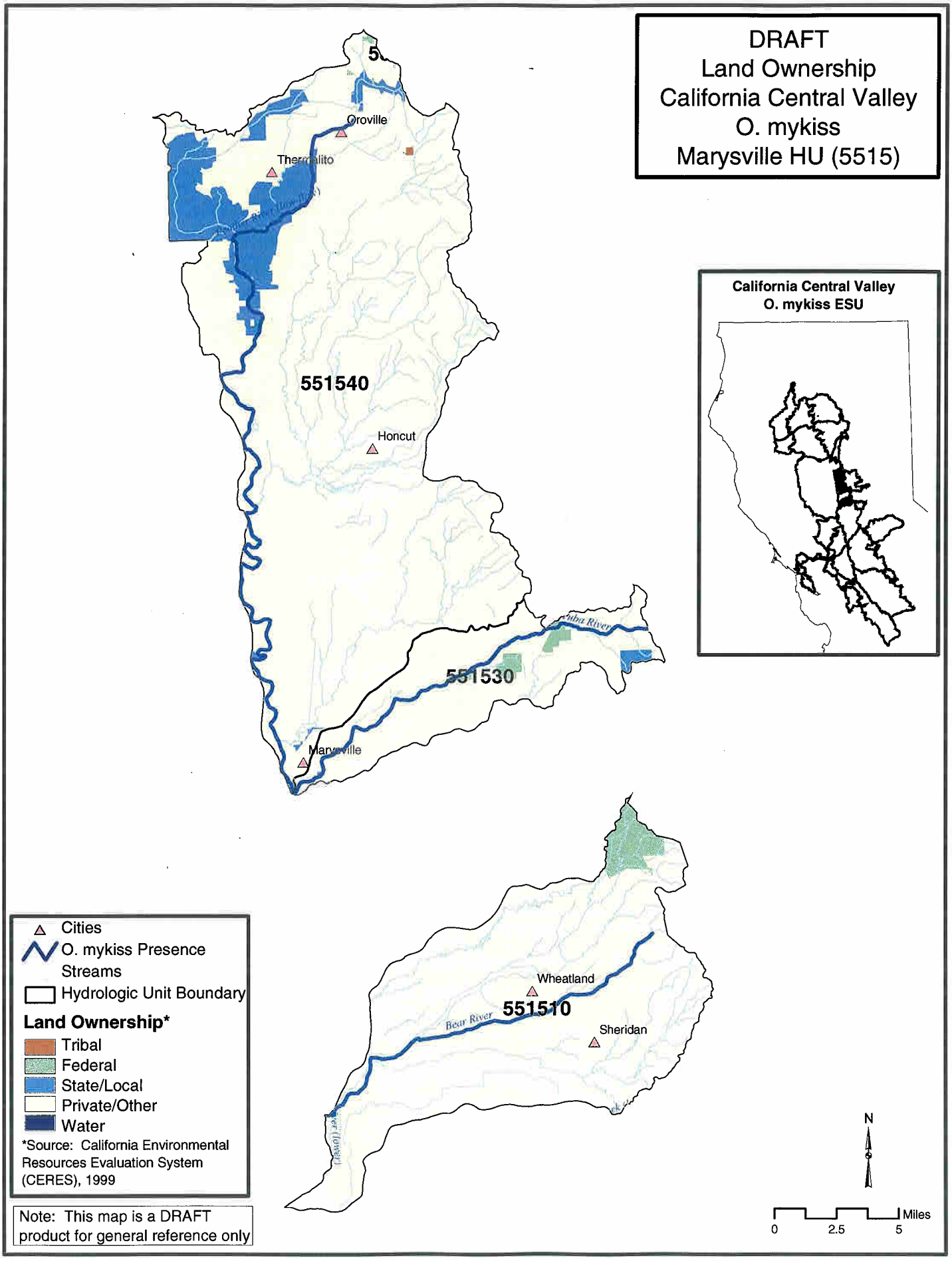
Note: This map is a DRAFT product for general reference only

N

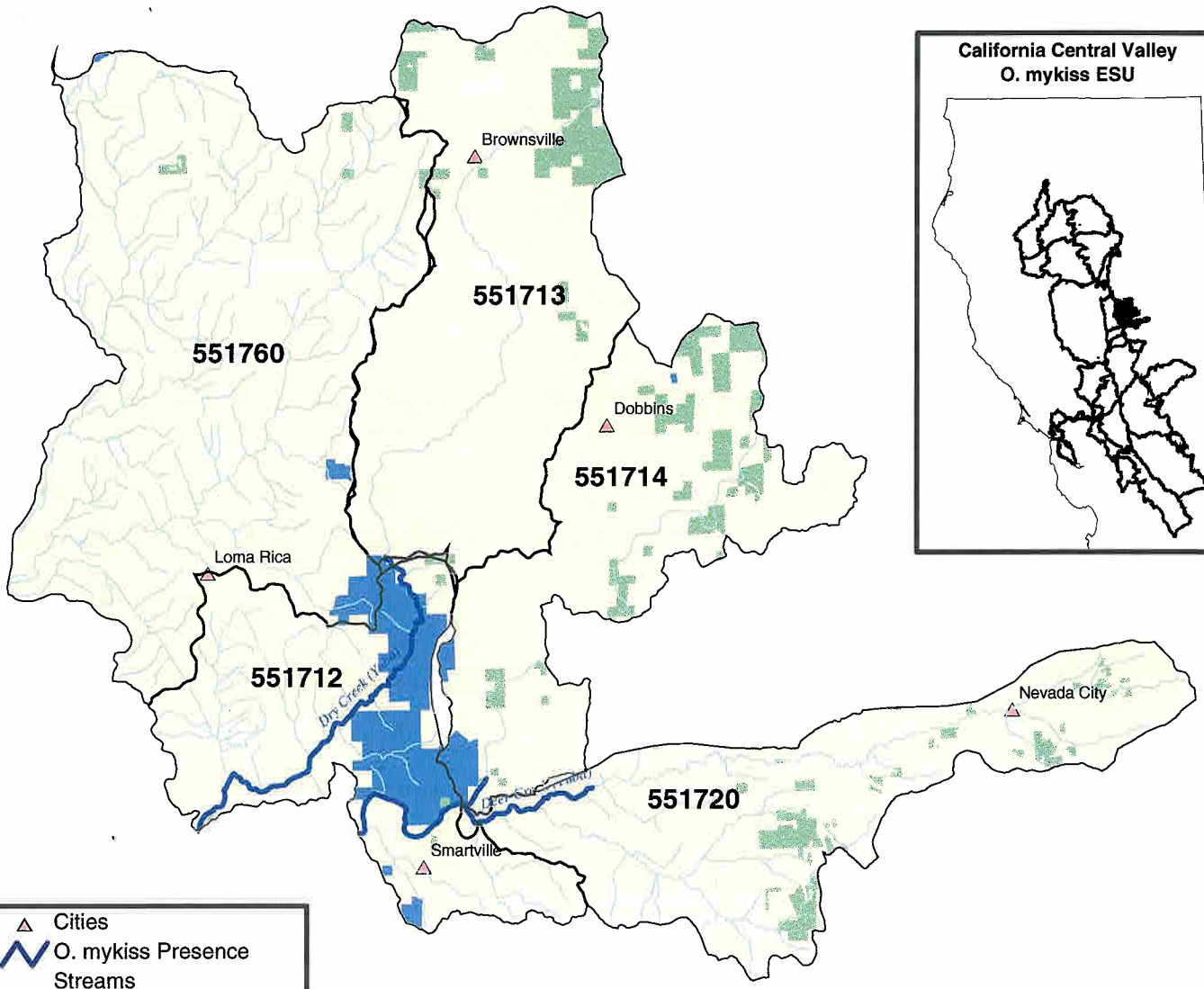
0 0.5 1 2 3 4 5 Miles

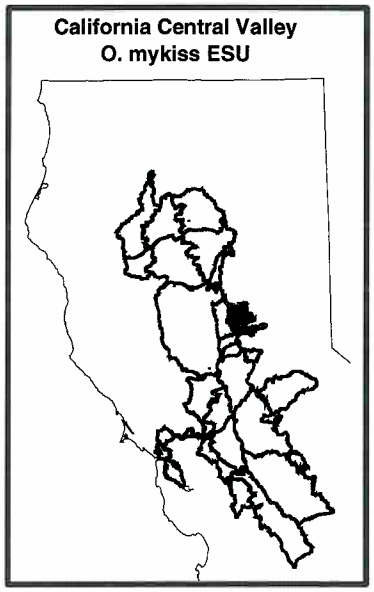
California Central Valley O. mykiss ESU



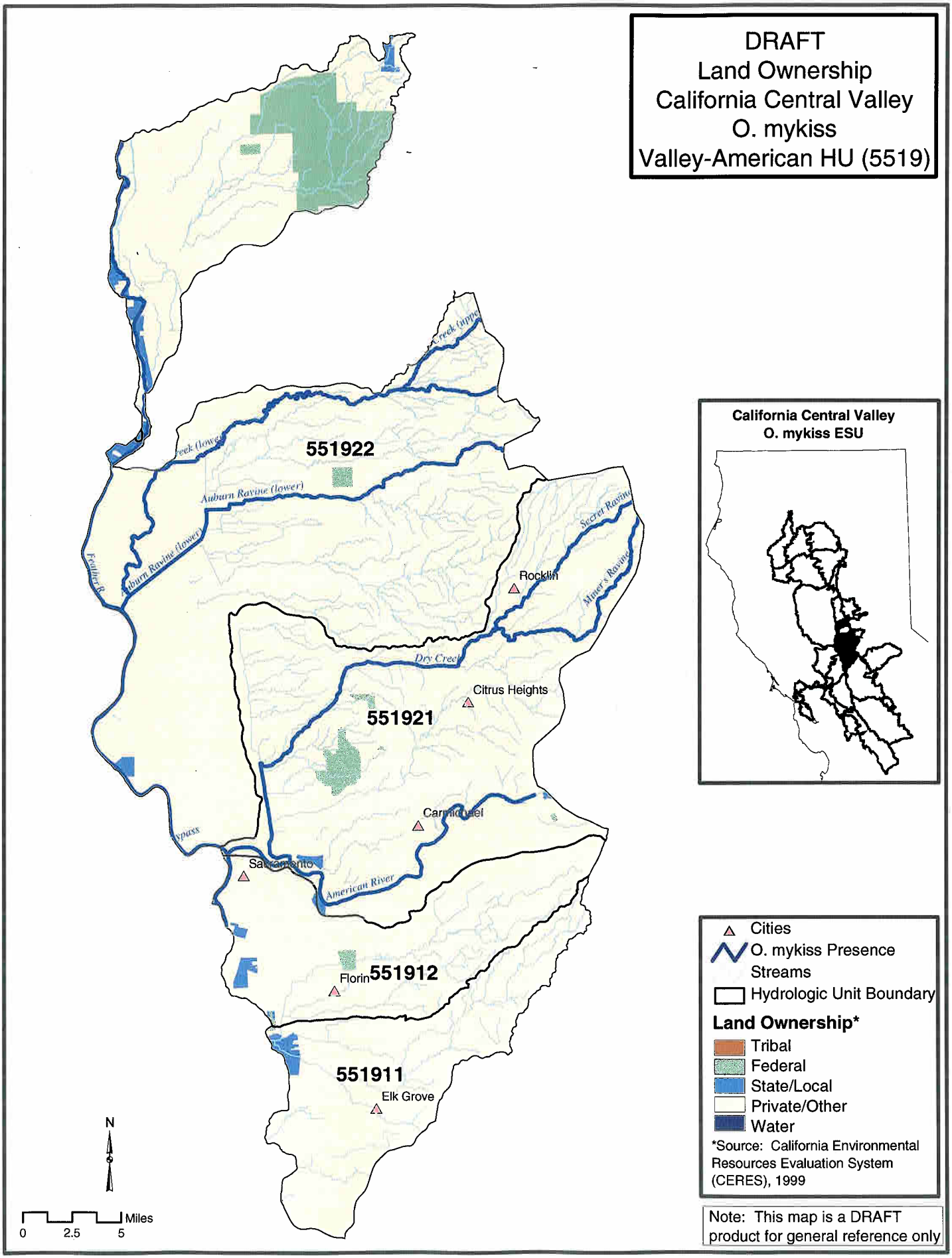

DRAFT
Land Ownership
California Central Valley
O. mykiss
Marysville HU (5515)
5
Oroville
Thermalito
551540
Honcut
Yuba River
551530
Marysville
California Central Valley
O. mykiss ESU
Wheatland
Bear River
551510
Sheridan
Cities
O. mykiss Presence
Streams
Hydrologic Unit Boundary
Land Ownership*
Tribal
Federal
State/Local
Private/Other
Water
*Source: California Environmental Resources Evaluation System (CERES), 1999
Note: This map is a DRAFT product for general reference only
N
Miles
0
2.5
5

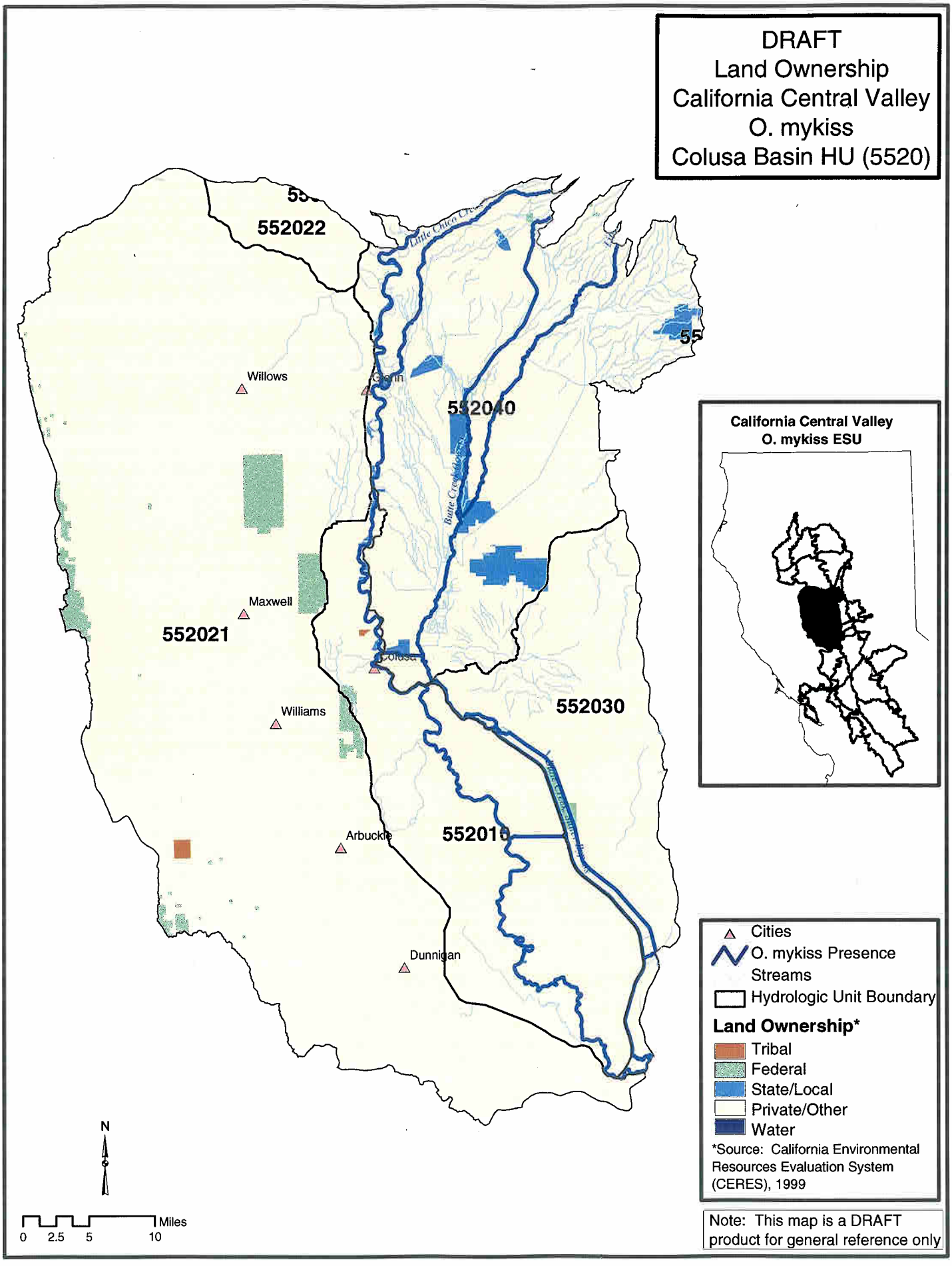
DRAFT
Land Ownership
California Central Valley
O. mykiss
Yuba River HU (5517)

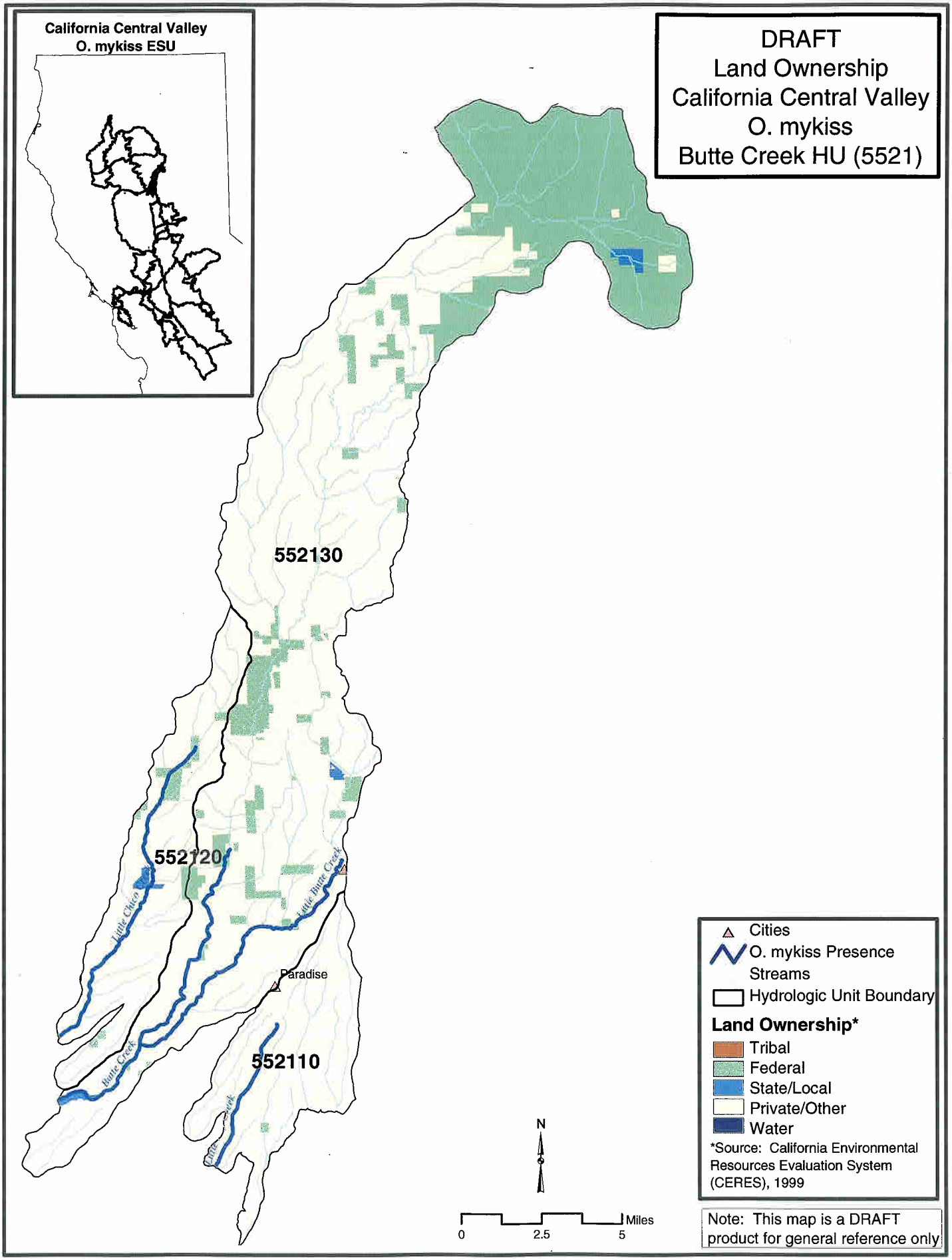


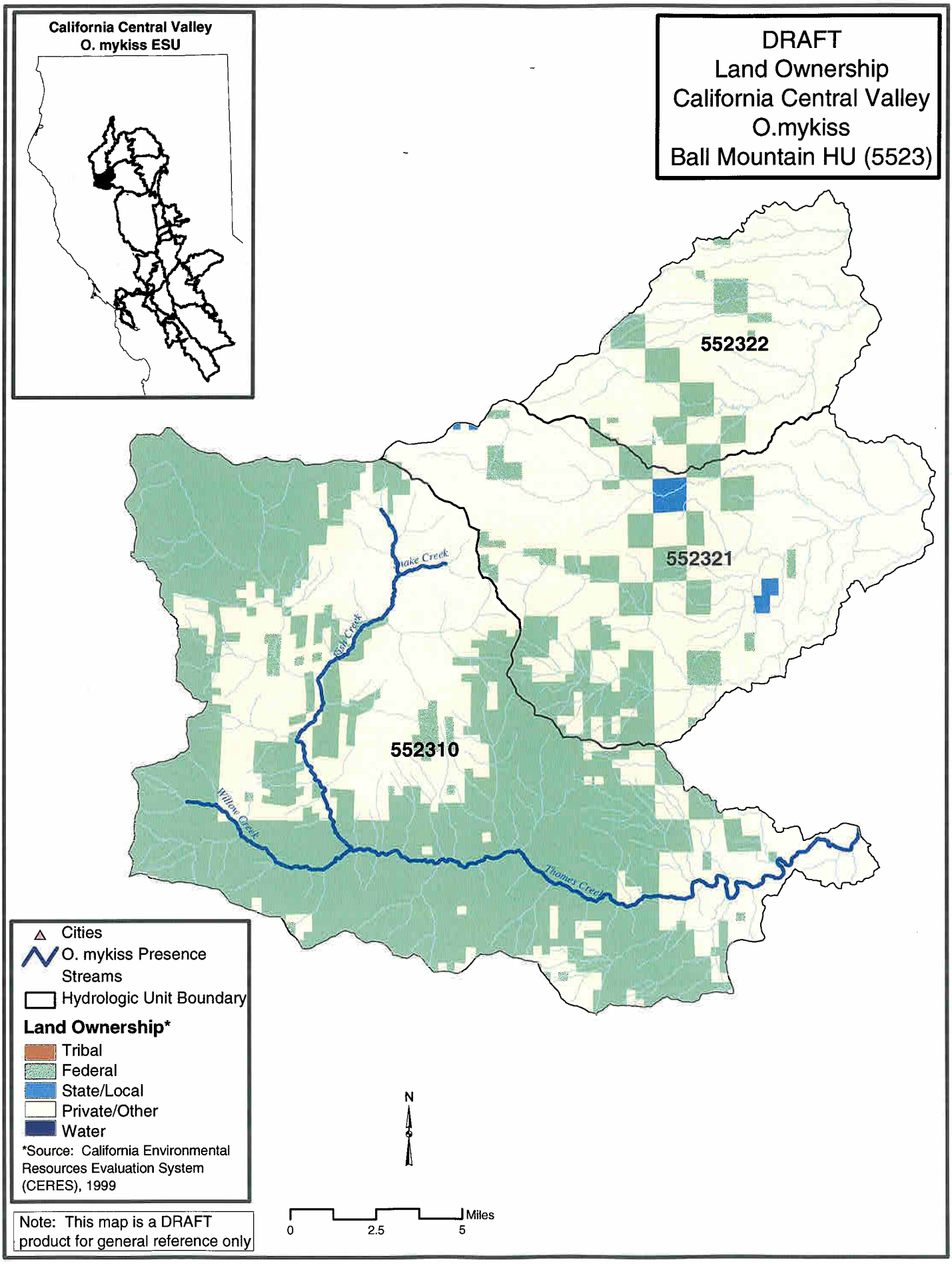


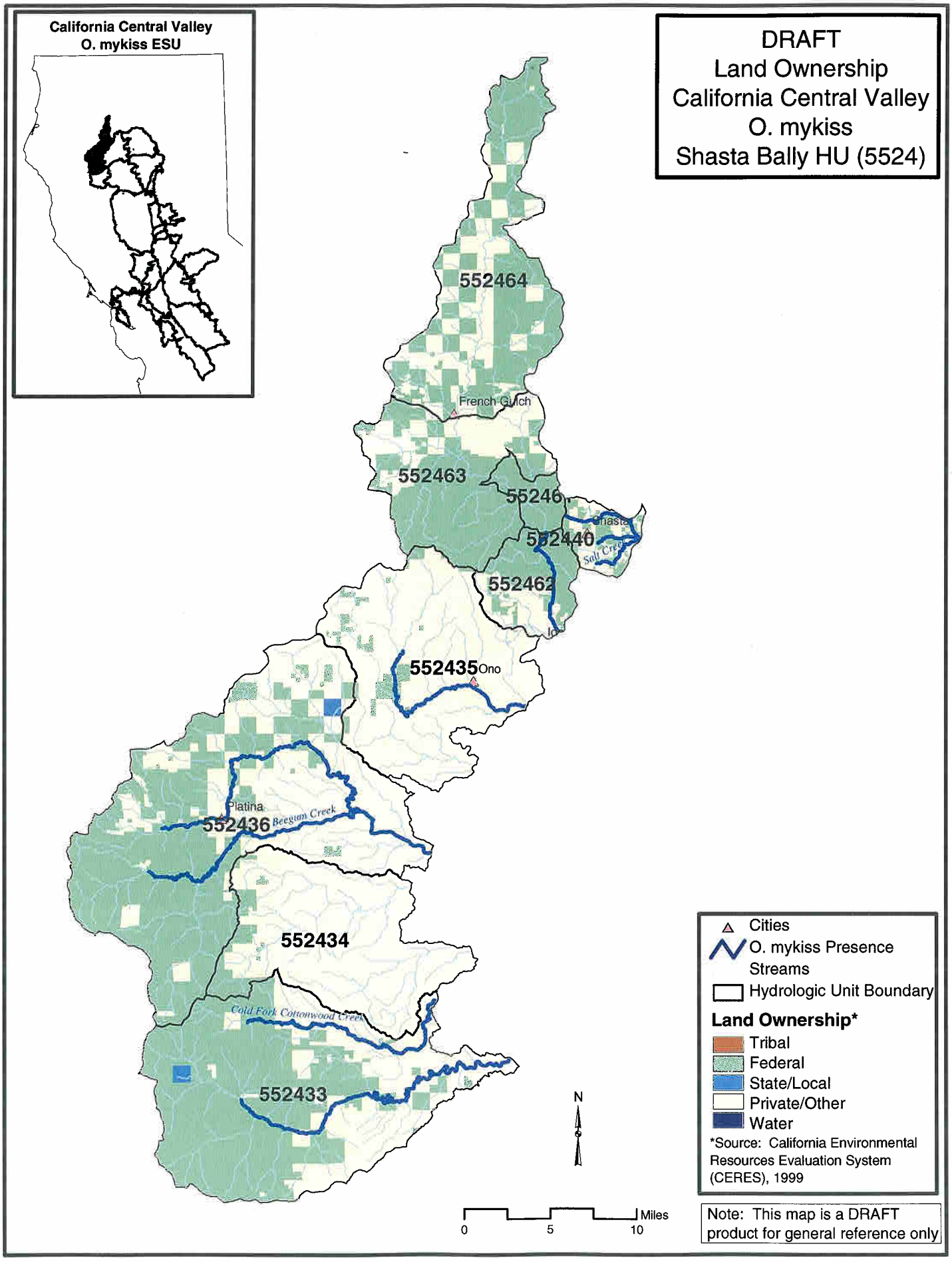
Note: This map is a DRAFT product for general reference only


DRAFT
Land Ownership
California Central Valley
O. mykiss
Valley-American HU (5519)
551922
551921
551912
551911
Auburn Ravine (lower)
Secret Ravine
Miner's Ravine
Dry Creek
American River
Rocklin
Citrus Heights
Florin
Elk Grove
Sacramento
California Central Valley
O. mykiss ESU
Cities
O. mykiss Presence
Streams
Hydrologic Unit Boundary
Land Ownership*
Tribal
Federal
State/Local
Private/Other
Water
*Source: California Environmental Resources Evaluation System (CERES), 1999
Note: This map is a DRAFT product for general reference only
N
0
2.5
5
Miles

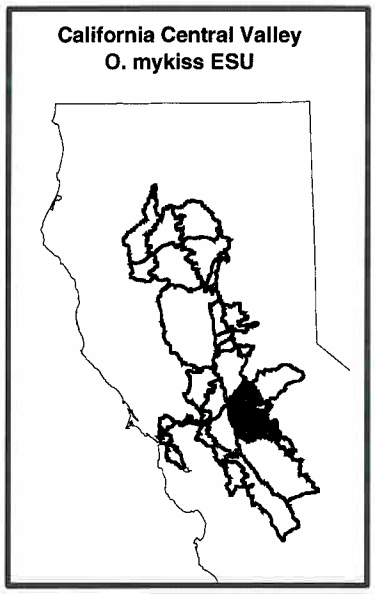

DRAFT
Land Ownership
California Central Valley
O. mykiss
Colusa Basin HU (5520)
552022
552040
552021
552030
552010
Willows
Maxwell
Williams
Arbuckle
Dunnigan
Colusa
Butte Creek
Little Chico Creek
California Central Valley
O. mykiss ESU
Cities
O. mykiss Presence
Streams
Hydrologic Unit Boundary
Land Ownership*
Tribal
Federal
State/Local
Private/Other
Water
*Source: California Environmental Resources Evaluation System (CERES), 1999
N
0 2.5 5 10 Miles
Note: This map is a DRAFT product for general reference only


California Central Valley
O. mykiss ESU
DRAFT
Land Ownership
California Central Valley
O. mykiss
Butte Creek HU (5521)
552130
552120
552110
Little Chico Creek
Little Butte Creek
Butte Creek
Paradise
N
0
2.5
5
Miles
Cities
O. mykiss Presence
Streams
Hydrologic Unit Boundary
Land Ownership*
Tribal
Federal
State/Local
Private/Other
Water
*Source: California Environmental Resources Evaluation System (CERES), 1999
Note: This map is a DRAFT product for general reference only


California Central Valley
O. mykiss ESU
DRAFT
Land Ownership
California Central Valley
O.mykiss
Ball Mountain HU (5523)
552322
552321
552310
Snake Creek
Elder Creek
Willow Creek
Thomes Creek
Cities
O. mykiss Presence
Streams
Hydrologic Unit Boundary
Land Ownership*
Tribal
Federal
State/Local
Private/Other
Water
*Source: California Environmental Resources Evaluation System (CERES), 1999
N
0
2.5
5
Miles
Note: This map is a DRAFT product for general reference only


California Central Valley
O. mykiss ESU
DRAFT
Land Ownership
California Central Valley
O. mykiss
Shasta Bally HU (5524)
552464
French Gulch
552463
55246
552440
552462
552435
Ono
Platina
552436
Beegum Creek
552434
Cold Fork Cottonwood Creek
552433
N
0
5
10
Miles
Cities
O. mykiss Presence
Streams
Hydrologic Unit Boundary
Land Ownership*
Tribal
Federal
State/Local
Private/Other
Water
*Source: California Environmental Resources Evaluation System (CERES), 1999
Note: This map is a DRAFT product for general reference only

DRAFT
Land Ownership
California Central Valley
O. mykiss
North Valley Floor HU (5531)



553112
553111
553120
553130
553140
Wilton
Galt
Dry Creek
Cosumnes River
Mokelumne River
Woodbridge
Lodi
Lockeford
Valley
Calaveras River
Lincoln Village
Linden
August
Garden Acres
Stockton
Farmington
French Camp

Cities
O. mykiss Presence
Streams
Hydrologic Unit Boundary

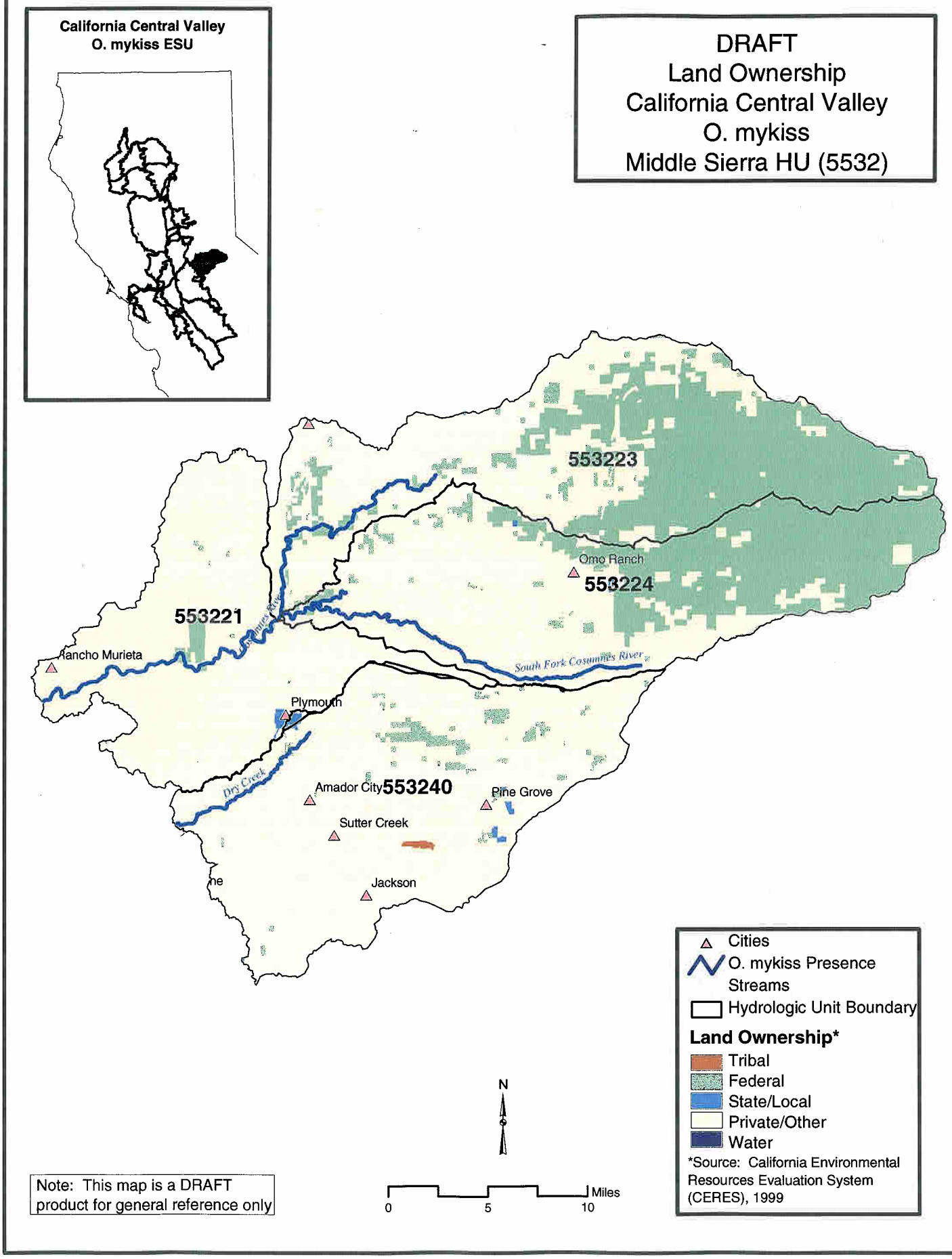
Land Ownership*
Tribal
Federal
State/Local
Private/Other
Water

*Source: California Environmental Resources Evaluation System (CERES), 1999

N

0 5 10 Miles

Note: This map is a DRAFT product for general reference only


California Central Valley
O. mykiss ESU
DRAFT
Land Ownership
California Central Valley
O. mykiss
Middle Sierra HU (5532)
553223
553224
553221
553240
Omo Ranch
Rancho Murieta
Plymouth
Amador City
Pine Grove
Sutter Creek
Jackson
Dry Creek
South Fork Cosumnes River
Cities
O. mykiss Presence
Streams
Hydrologic Unit Boundary
Land Ownership*
Tribal
Federal
State/Local
Private/Other
Water
*Source: California Environmental Resources Evaluation System (CERES), 1999
N
0
5
10
Miles
Note: This map is a DRAFT product for general reference only

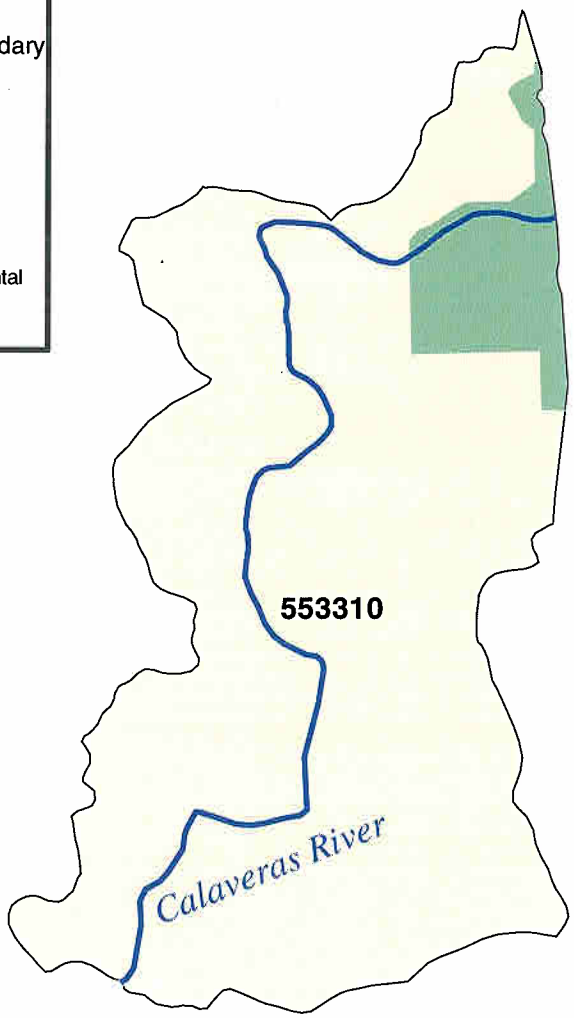
DRAFT
Land Ownership
California Central Valley
O. mykiss
Upper Calaveras HU (5533)

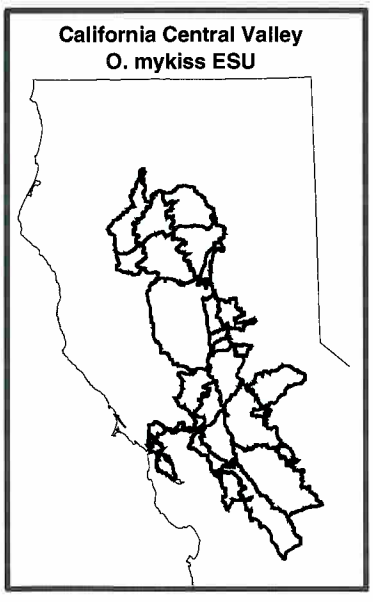
Cities
O. mykiss Presence
Streams
Hydrologic Unit Boundary

Land Ownership*

Tribal
Federal
State/Local
Private/Other
Water

*Source: California Environmental Resources Evaluation System (CERES), 1999





N

0 0.5 1 2 Miles

Note: This map is a DRAFT product for general reference only

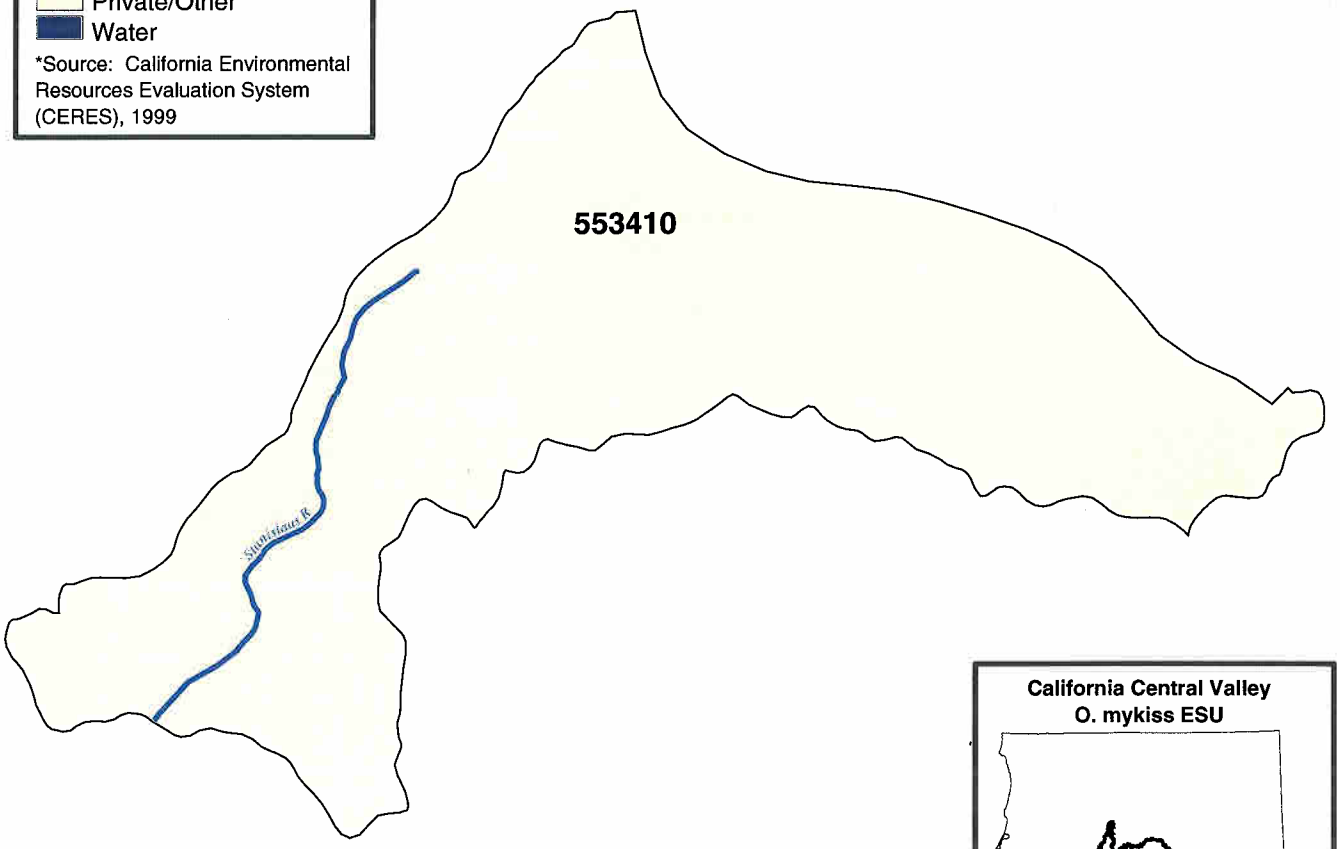
DRAFT
Land Ownership
California Central Valley
O. mykiss
Stanislaus River HU (5534)

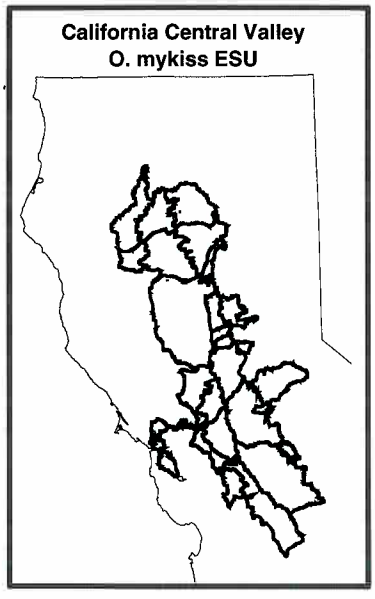
Cities
O. mykiss Presence Streams
Hydrologic Unit Boundary

Land Ownership*

Tribal
Federal
State/Local
Private/Other
Water

*Source: California Environmental Resources Evaluation System (CERES), 1999



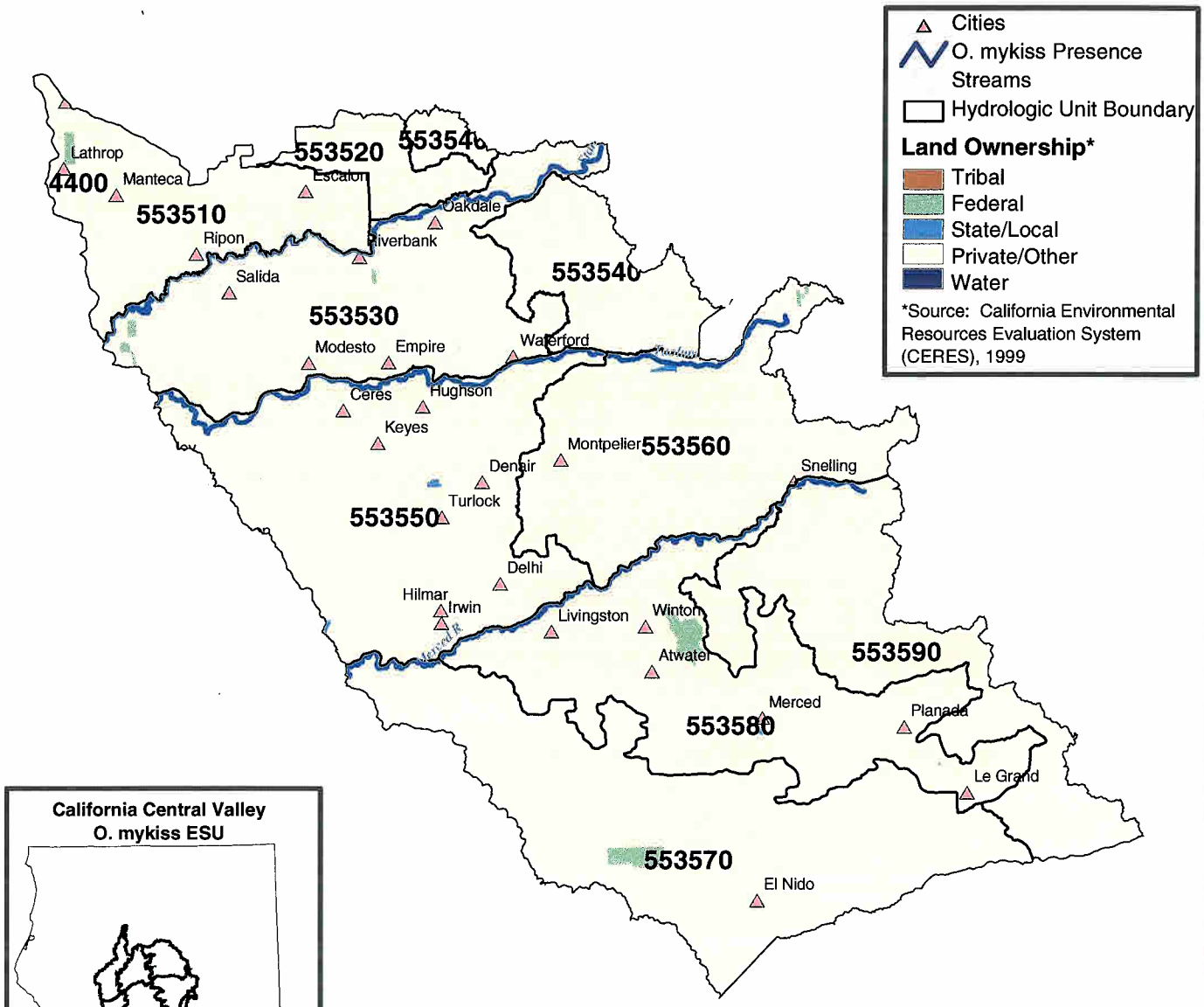


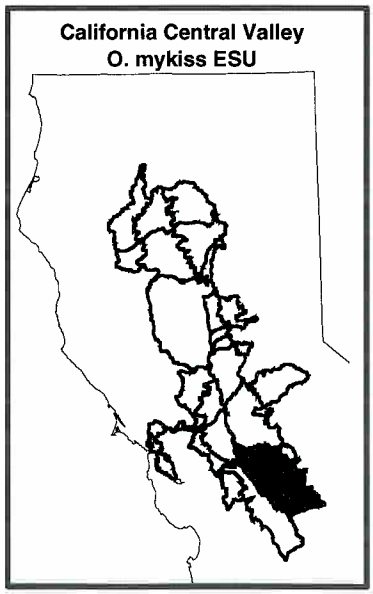
N

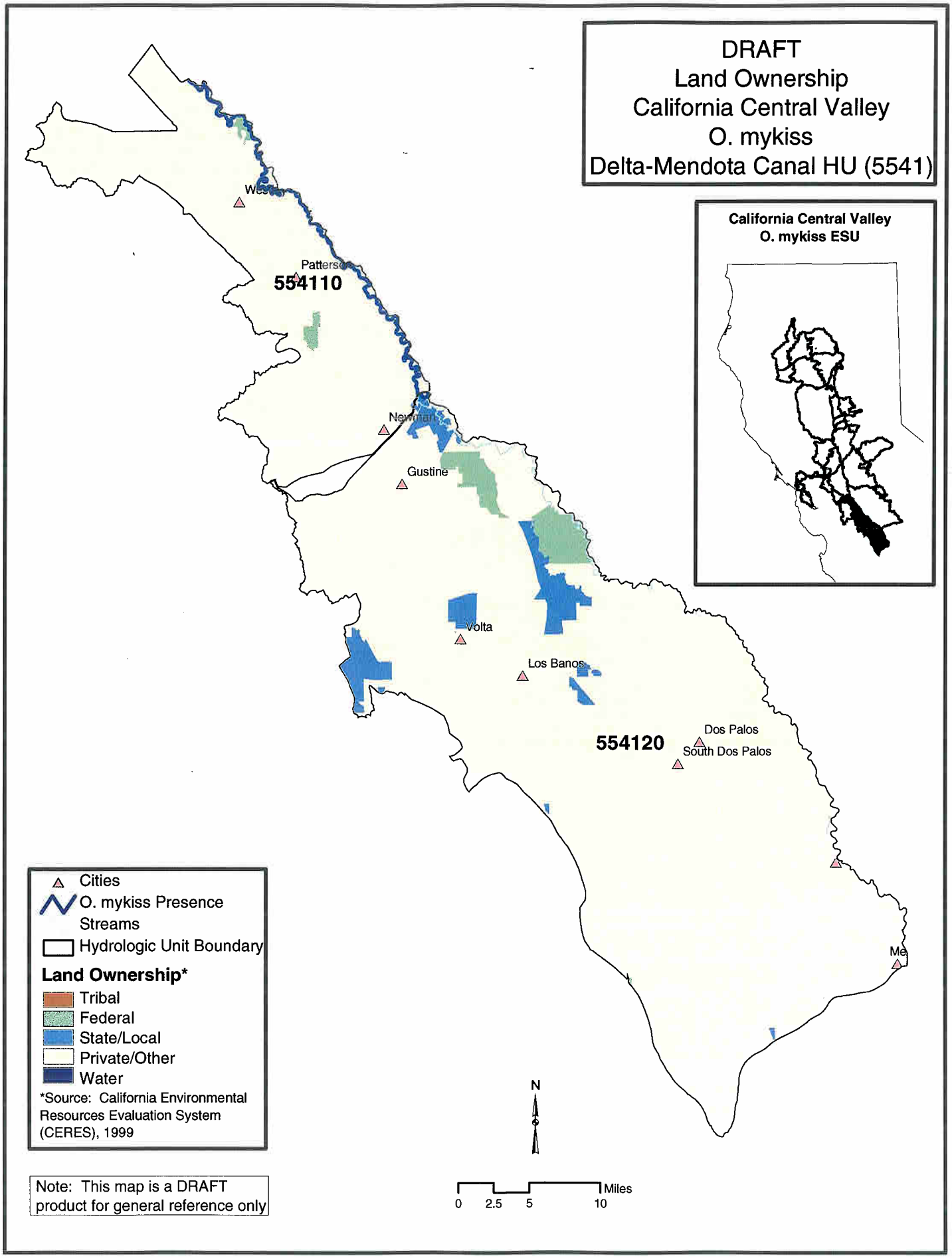
0 0.5 1 2 Miles

Note: This map is a DRAFT product for general reference only

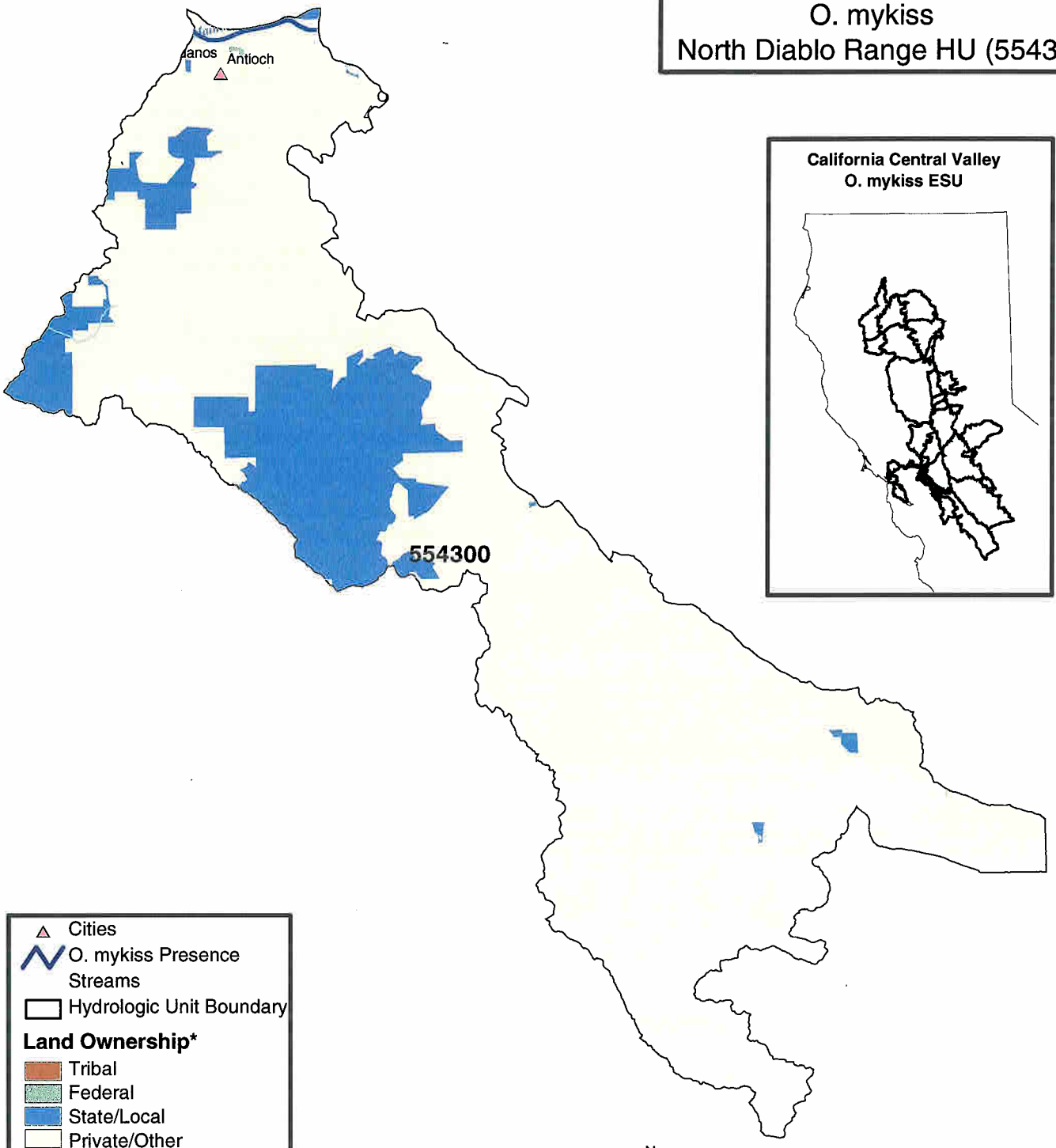
DRAFT
Land Ownership
California Central Valley
O. mykiss
San Joaquin Valley Floor HU (5535)





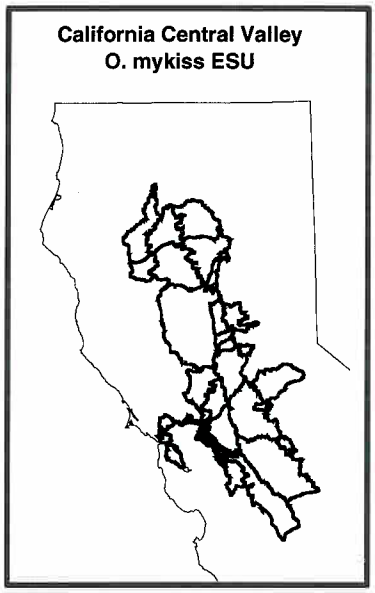

DRAFT
Land Ownership
California Central Valley
O. mykiss
Delta-Mendota Canal HU (5541)
California Central Valley
O. mykiss ESU
554110
554120
Newman
Gustine
Volta
Los Banos
Dos Palos
South Dos Palos
Cities
O. mykiss Presence
Streams
Hydrologic Unit Boundary
Land Ownership*
Tribal
Federal
State/Local
Private/Other
Water
*Source: California Environmental Resources Evaluation System (CERES), 1999
Note: This map is a DRAFT product for general reference only
N
0
2.5
5
10
Miles

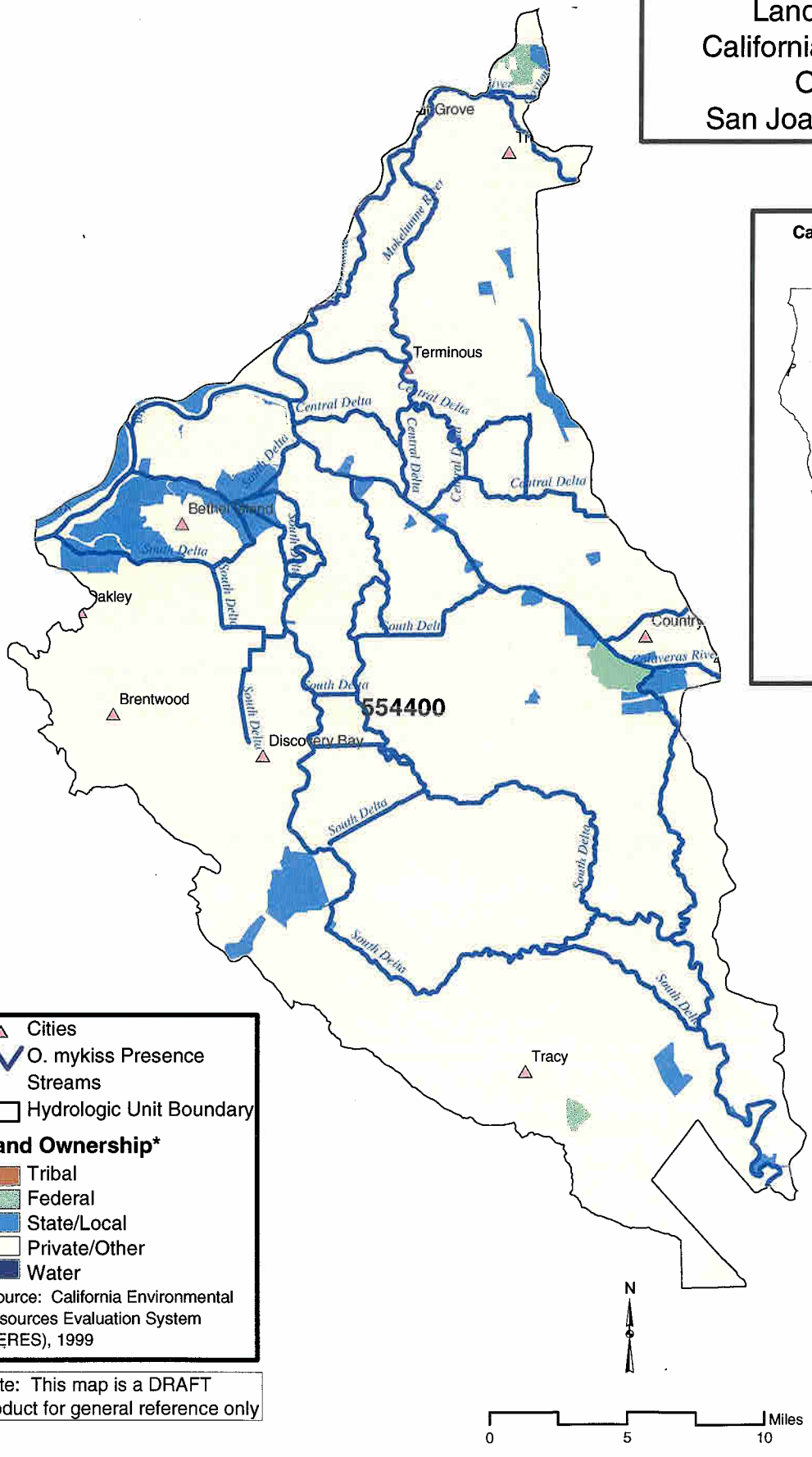
DRAFT
Land Ownership
California Central Valley
O. mykiss
North Diablo Range HU (5543)



Note: This map is a DRAFT product for general reference only

DRAFT
Land Ownership
California Central Valley
O. mykiss
San Joaquin HU (5544)





Note: This map is a DRAFT product for general reference only

Map G23. Preliminary CHART Ratings of Conservation Value for Calwater HSA Watersheds occupied by the Central Valley *O. mykiss* ESU

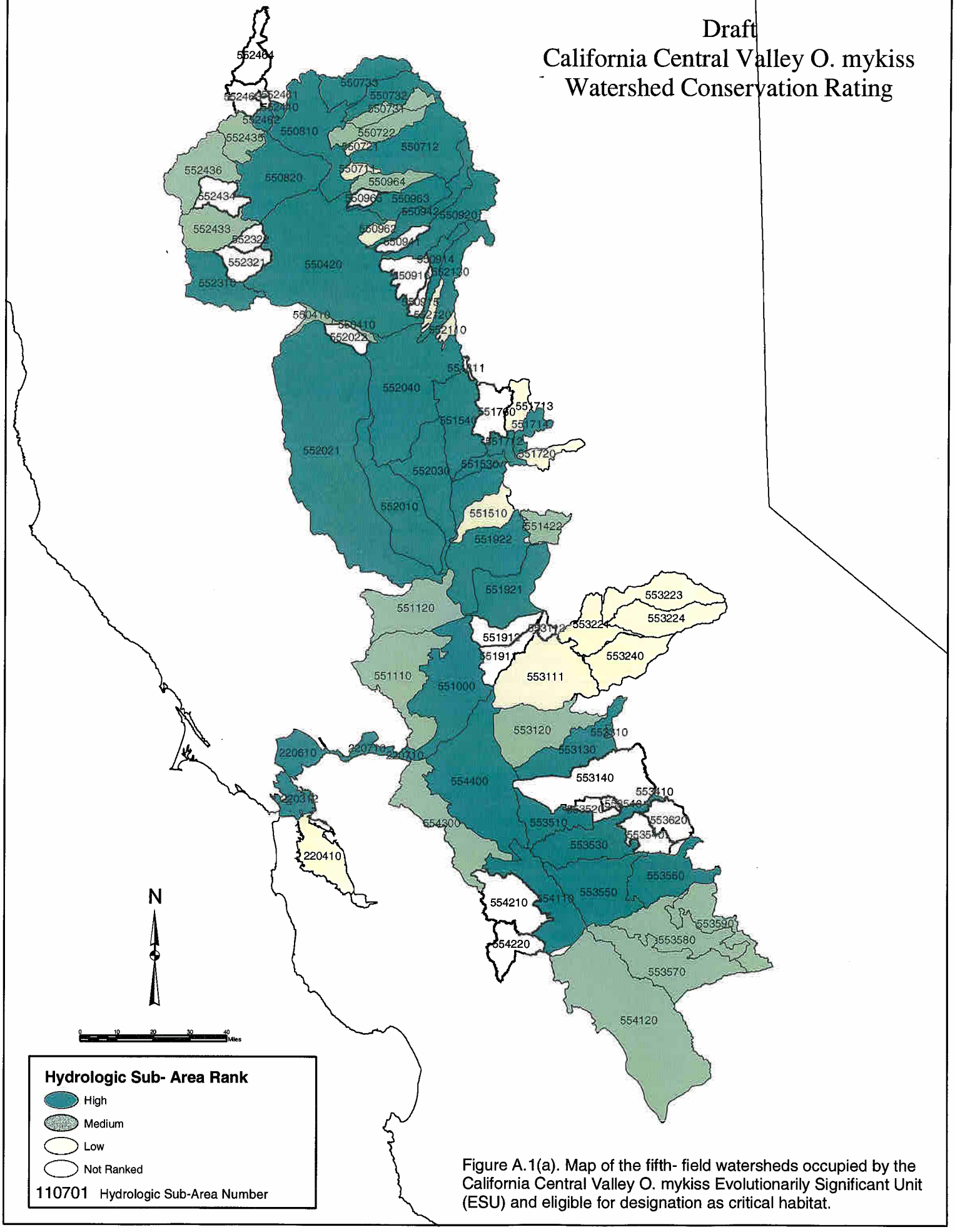


Figure A.1(a). Map of the fifth- field watersheds occupied by the California Central Valley O. mykiss Evolutionarily Significant Unit (ESU) and eligible for designation as critical habitat.